



Heat pump



TWW 550
WHR
HeavyDuty 2L5

WAMAK TWW 550 WHR HeavyDuty 2L5

Product description

High-efficiency heat pump consisting of multiple modules of separate heat pumps. Each module contains one short closed refrigerant circuit with a pair of quiet Scroll compressors and robust stainless steel plate heat exchangers. Applications range from heating, cooling and domestic hot water heating of office or multi-functional buildings, to cascading applications in industrial applications.

Use for demanding industrial applications. By combining the most suitable performance and application variants of heat pump modules, it is possible to tailor-make the complete system required. Each module is refrigeration, hydraulically and electrically isolated with a separate controller. The connection of the modules is cascaded, whereby each single controller can take over the function of the cascade master.

Thermal energy from various industrial or ancillary processes is used as a primary source. Usually in the temperature range between 20° and 50°C. Depending on the quality and chemical composition of the process medium, the heat is extracted either directly in the heat pump or via a pre-wired heat exchanger with intermediate circuit. The heat pump then raises this temperature with high efficiency to a usable temperature for heating or hot water.

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

Product features

- Scroll compressor
- Electronic expansion valve
- Two-stage capacity control
- Phase and rotation control
- High pressure sensor - analogue
- Flow switch consumer - on/off - (with accessory)
- Flow switch source - on/off - (with accessory)
- DHW temperature sensor - (with accessory)
- Cascade control
- Solid frame structure
- Sylomer pads under compressor unit
- Asymetric plate heat exchanger
- Multi-stage capacity control
- High pressure switch
- Low pressure sensor - analogue
- Flow sensor consumer - analogue - (with accessory)
- Outdoor temperature sensor - (with accessory)
- Buffer temperature sensor - (with accessory)
- Modbus connection
- Two level frame

Basic performance data - WAMAK TWW 550 WHR HeavyDuty 2L5

Heating - EN 14511		
Heating capacity [kW]	W10 / W35 (max)	303.6 (30.4 / 303.6)
	W10 / W35 (min)	30.4 (30.4 / 303.6)
	W10 / W34	305.4 (30.5 / 305.4)
Electrical power input [kW]	W10 / W35 (max)	51.5 (5.0 / 51.5)
	W10 / W35 (min)	5.0 (5.0 / 51.5)
	W10 / W34	50.6 (4.9 / 50.6)
Heating efficiency faktor [COP]	W10 / W35 (max)	5.89
	W10 / W35 (min)	6.08
	W10 / W34	6.04
Seasonal space heating energy efficiency - SCOP EN 14825		
Average Climate / Low Temperature [35°C]	SCOP	3.65
	η [%]	145.9
	Label	A++
	Qhe [kWh]	627237.6
	Pdesignh [kW]	303.6
	Tbivalent [°C]	-7
Cooling		
Cooling capacity - [kW]	A35 / W23-18	229.8
	A25 / W23-18	258.5
	A35 / W12-7	149.7
	A25 / W12-7	149.7
Seasonal space cooling energy efficiency - SEER EN 14825		
[W 23 / 18°C]	SEER	5.44
	Qce [kWh]	89820.0
	η_c [%]	217.6
Sound EN 12102		
Acoustic power - Lw	dB(A)	75.1
Acoustic pressure - Lp	1 m dB(A)	67.1
	5 m dB(A)	53.1
	10 m dB(A)	47.1
Mechanical and operational information		
Compressor type (3~ 400/50)	SCROLL / 10 /	On/Off
Refrigerant	R513A (GWP - 631)	5 x 16 kg
Operating limit temperatures heating - (min / max) [°C]		45 / 85
Operating limit temperatures source - (min / max) [°C]		-10 / 50
Weight		2650 kg

Main technical data - WAMAK TWW 550 WHR HeavyDuty 2L5

Enclosure type			HD2L5	
Basic dimensions	Height [mm]	2000		
	Width [mm]	3450		
	Length [mm]	1200		
Weight [kg]		2650		
Colour		Gray		
Enclosure IP Class		IP20		
Refrigeration cycle				
Compressor	Type	Scroll		
	Number of stages	10		
	On/Off			
	Power factor Cosφ	0.63		
	Winding resistance	1.23 Ohm		
Refrigerant		R513A		
	Volme	5 x 16 kg		
	GWP	631		
	Safety class	A1		
Refrigeration oil type	POE RL32-3MAF			
	Oil volume	10 x 3.25 L		
Maximal pressure - refrigerant [bar]		32		
PED class		2		
EVI - vapour injection with economizer				
Electrical connection data				
Line voltage [#~ V/Hz]		3~ 400/50		
Current	nominal [A]	172.20		
	maximal [A]	223.00		
	starting [A]	12.9		
Softstart		-		
Main safety		C240		
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		SEC61		
*** with accessory				
Heat energy rejection side data				
Operating limit temperatures heating	MAX [°C]		85	
	MIN [°C]		45	
for more see operating limits diagram				
Condenser	Port size	5 x VIC 2.1/2 "		
	Type	BPHE		
	Count	5		
	Material	AISI 316		
Maximal operating pressure - refrigerant [bar]			32	
Maximal operating pressure - Water [bar]			6	
Testing pressure [bar]			70	
Heat transfer medium			Water	
Volume flow @ dT 5K (nom) - Water [m3/h]			7.27 ~ 72.66	
Internal pressure drop - Water [kPa]			5 x 20	
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]		-10	
	MAX [°C]		50	
for more see operating limits diagram				
Evaporator	Port size	5 x VIC 2.1/2 "		
	Type	BPHE		
	Count	5		
	Material	AISI 316		
Maximal operating pressure - refrigerant [bar]			20	
Heat transfer medium			Water	
Maximal operating pressure - Water [bar]			6	
Volume flow - Water [m3/h]			6.84 ~ 68.41	
Internal pressure drop - Water [kPa]			5 x 20	
Temperature difference - Water			4 K	

WAMAK TWW 550 WHR HeavyDuty 2L5

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

Model	TWW 550 WHR HeavyDuty 2L5
Air-to-water heat pump	no
Brine-to-water heat pump	no
Water-to-water heat pump	yes
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	Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	303.6	kW	Seasonal space heating energy efficiency	ηs	145.9	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	305.4	kW	Tj = -7 °C	COPd	6.04	-
Tj = +2 °C	Pdh	312.8	kW	Tj = +2 °C	COPd	6.6	-
Tj = +7 °C	Pdh	31.8	kW	Tj = +7 °C	COPd	7.4	-
Tj = +12 °C	Pdh	32.3	kW	Tj = +12 °C	COPd	7.9	-
Tj = bivalent temperature	Pdh	303.6	kW	Tj = bivalent temperature	COPd	5.9	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-7	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	85	°C
Off mode	Poff	0.040	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	57.6	kW
Standby mode	Psb	0.010	kW	Type of energy input		electricity	
Crankcase heater mode	Pck	0.050	kW				
Other items							
Capacity control		multi-stage		For air-to-water heat pumps: Rated air flow rate, outdoors	-	---	m3/h
Sound power level				For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	6.84 ~ 68.41	m3/h
indoors	Lwa	75	dB				
outdoors	Lwa	---	dB				
Annual energy consumption	QHE	627237.6	kWh				

Contact details: WAMAK, s.r.o., Orovnic 252, 96652, Orovnic, Slovakia, info@wamak.sk

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

Model	TWW 550 WHR HeavyDuty 2L5
Air-to-water heat pump	no
Brine-to-water heat pump	no
Water-to-water heat pump	yes
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	Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	264.8	kW	Seasonal space heating energy efficiency	ηs	131.6	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	277.0	kW	Tj = -7 °C	COPd	3.97	-
Tj = +2 °C	Pdh	299.0	kW	Tj = +2 °C	COPd	5.3	-
Tj = +7 °C	Pdh	31.0	kW	Tj = +7 °C	COPd	6.3	-
Tj = +12 °C	Pdh	31.8	kW	Tj = +12 °C	COPd	7.0	-
Tj = bivalent temperature	Pdh	264.8	kW	Tj = bivalent temperature	COPd	3.5	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-7	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	85	°C
Off mode	Poff	0.040	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	57.6	kW
Standby mode	Psb	0.010	kW	Type of energy input		electricity	
Crankcase heater mode	Pck	0.050	kW				
Other items							
Capacity control		multi-stage		For air-to-water heat pumps: Rated air flow rate, outdoors	-	---	m3/h
Sound power level				For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	6.84 ~ 68.41	m3/h
indoors	Lwa	75	dB				
outdoors	Lwa	---	dB				
Annual energy consumption	QHE	547076.8	kWh				

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WAMAK

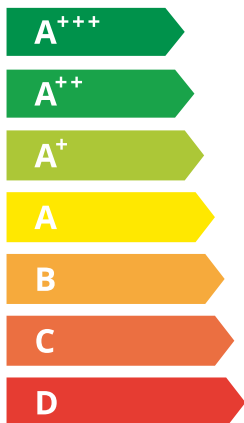
TWW 550 WHR

HeavyDuty 2L5



55 °C

35 °C



A++

A++



75 dB



--- dB

■ 279
■ 265
■ 260
kW

■ 310
■ 304
■ 289
kW



2019

811/2013

TWW 550 WHR

HeavyDuty 2L5

ErP Data

55 °C

35 °C

Energy class	A++	A++
η [%]	131.6	145.9
P_{rated} [kW]	265	304
Q_{HE} [kWh/y]	547077	627238
SCOP [-]	3.29	3.65
$T_{bivalent}$ [°C]	-7	-7

CONTROLLER



+ QAA55/75

class VII

3.5% ↓

- QAA55/75

class III

1.5% ↓

Heating performance data

Heat recovery

Version: v202223.006-WW-WHR

ZR144KRE-TFD_R513A_10_WHR

Operating conditions	Qh	P	COP
W45 / W80	566.0	126.5	4.47
W30 / W70	420.6	104.1	4.04
W25 / W60	467.9	85.8	5.45

Normative data: water - water application

Source - Water [10°C] / Low Temperature [35°C]

Operating conditions	Qh	P	COP
1 W10 / W30-35	303.6	51.5	5.89
2 W10 / W30-35 (MIN)	30.4	5.0	6.08
A W10 / Wxx-34	305.4	50.6	6.04
B W10 / Wxx-30	312.8	47.1	6.65
C W10 / Wxx-27	31.8	4.3	7.36
D W10 / Wxx-24	32.3	4.1	7.90
E W10 / Wxx-35	303.6	51.5	5.89
F W10 / Wxx-35	303.6	51.5	5.89

Source - Water [10°C] / Medium Temperature [55°C]

Operating conditions	Qh	P	COP
1 W10 / W47-55	264.8	75.7	3.50
2 W10 / W47-55 (MIN)	26.5	7.3	3.61
A W10 / Wxx-52	277.0	69.8	3.97
B W10 / Wxx-42	299.0	56.5	5.29
C W10 / Wxx-36	31.0	5.0	6.25
D W10 / Wxx-30	31.8	4.6	6.96
E W10 / Wxx-55	264.8	75.7	3.50
F W10 / Wxx-55	264.8	75.7	3.50

SCOP DATA EN 14825:2018

Source - Water [10°C] / Low Temperature [35°C]

SCOPon	3.66
SCOPnet	7.87
SCOP	3.65
η [%]	145.92
Label	A++
Qh [kWh]	627238
Pdesignh [kW]	303.6
Tbivalent [°C]	-7.00

SCOP DATA EN 14825:2018

Source - Water [10°C] / Medium Temperature [55°C]

SCOPon	3.30
SCOPnet	5.72
SCOP	3.29
η [%]	131.60
Label	A++
Qh [kWh]	547077
Pdesignh [kW]	264.8
Tbivalent [°C]	-7.00

Low temperature cooling W 12 / 7°C

Operating conditions		Qc	P	EER	SEER DATA EN 14825:2018 [W 12 / 7°C]	
A	W30-35 / W12-7	160.8	54.5	2.95	SEERon	3.64
B	W26-xx / W12-7	169.3	50.6	3.35	SEER	3.62
C	W22-xx / W12-7	177.4	47.0	3.77	Qc [kWh]	89820
D	W18-xx / W12-7	181.3	45.4	4.00	η [%]	144.91

Radiant cooling W 23 / 18°C

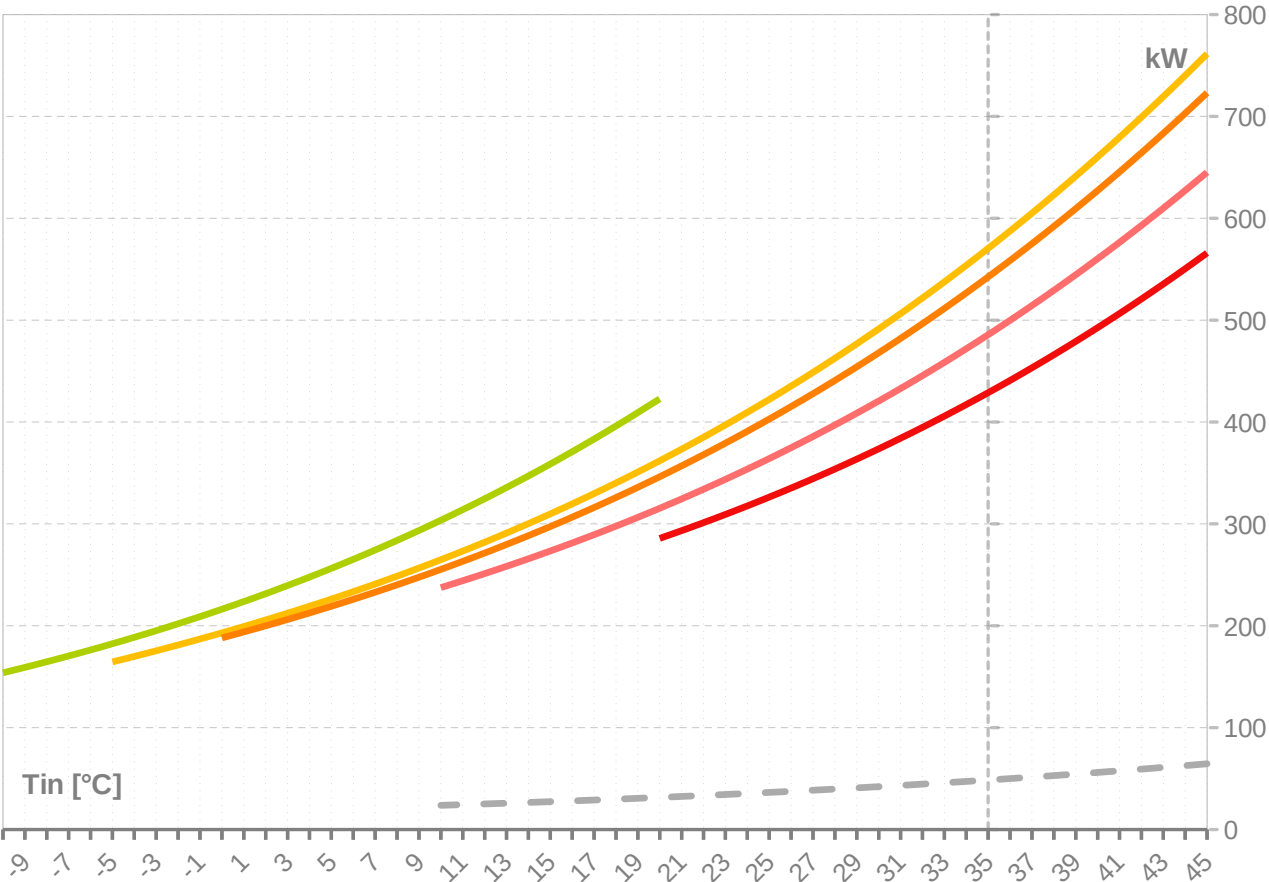
Operating conditions		Qc	P	EER	SEER DATA EN 14825:2018 [W 23 / 18°C]	
A	W50-xx / W23-18	180.9	82.0	2.21	SEERon	5.48
B	W40-xx / W23-18	214.3	66.4	3.23	SEER	5.44
C	W30-35 / W23-18	244.6	54.5	4.49	Qc [kWh]	89820
D	W26-xx / W23-18	255.8	50.6	5.06	η [%]	217.65

WAMAK TWW 550 WHR HeavyDuty 2L5

ZR144KRE-TFD_R513A_10_WHR

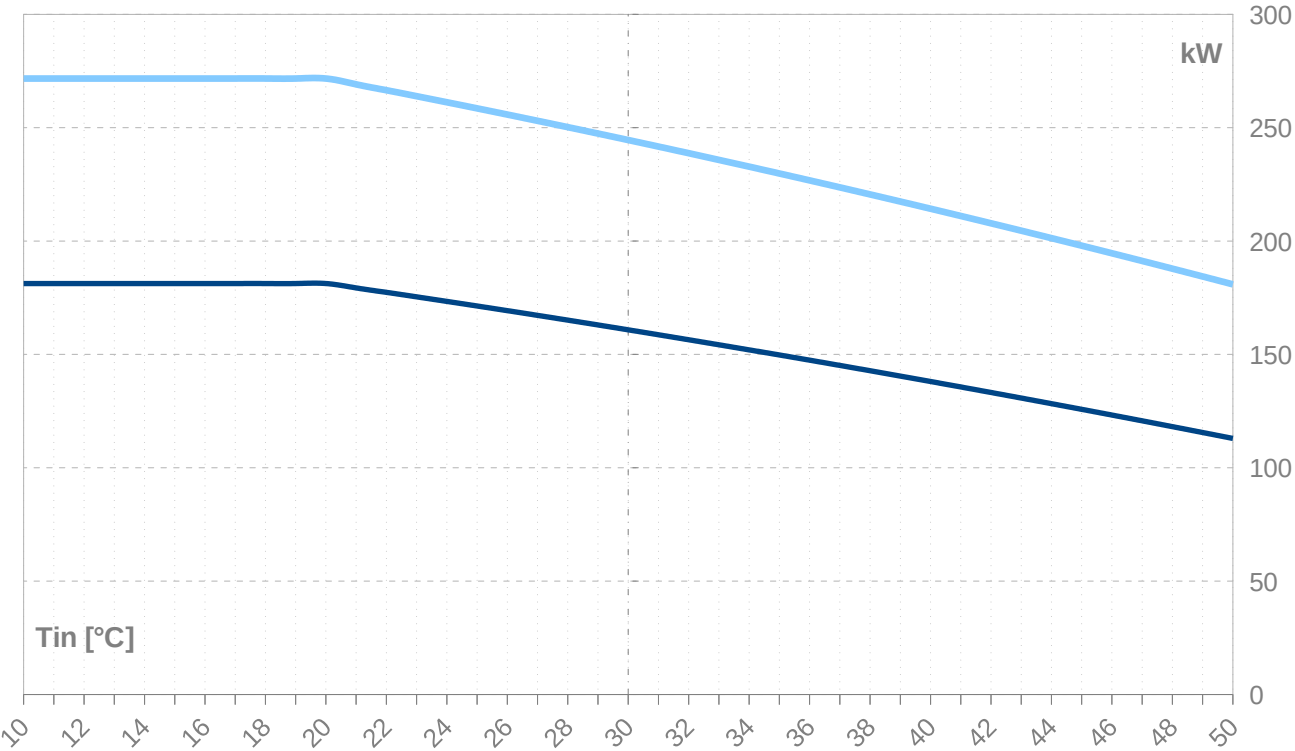
Performance lines - heating

Qh-nom-35 Qh-nom-55 Qh-nom-60 Qh-nom-70 Qh-nom-80
Qh-min-70



Performance lines - cooling

Qc-nom-12-7 Qc-nom-23-18



Th -OU	55										
	°C]										
Ts -IN [°C]	Qh nom [kW]	Qh min [kW]	Qh max [kW]	Pin nom [kW]	Pin min [kW]	Pin max [kW]	COP nom kW / kW	Qc nom [kW]	Qc min [kW]	Qc max [kW]	I nom [A]
45	761.4	76.1	761.4	81.7	7.9	81.7	9.32	685.6	68.6	685.6	146.6
44	740.2	74.0	740.2	81.5	7.9	81.5	9.09	664.7	66.5	664.7	146.3
43	719.5	71.9	719.5	81.2	7.9	81.2	8.86	644.2	64.4	644.2	146.0
42	699.2	69.9	699.2	80.9	7.8	80.9	8.64	624.2	62.4	624.2	145.7
41	679.5	67.9	679.5	80.7	7.8	80.7	8.42	604.6	60.5	604.6	145.4
40	660.2	66.0	660.2	80.4	7.8	80.4	8.21	585.6	58.6	585.6	145.1
39	641.3	64.1	641.3	80.2	7.8	80.2	8.00	566.9	56.7	566.9	144.8
38	622.9	62.3	622.9	80.0	7.8	80.0	7.79	548.8	54.9	548.8	144.5
37	605.0	60.5	605.0	79.7	7.7	79.7	7.59	531.1	53.1	531.1	144.2
36	587.5	58.7	587.5	79.5	7.7	79.5	7.39	513.8	51.4	513.8	143.9
35	570.4	57.0	570.4	79.3	7.7	79.3	7.20	496.9	49.7	496.9	143.7
34	553.8	55.4	553.8	79.1	7.7	79.1	7.00	480.5	48.0	480.5	143.4
33	537.6	53.8	537.6	78.9	7.6	78.9	6.82	464.5	46.4	464.5	143.2
32	521.8	52.2	521.8	78.7	7.6	78.7	6.63	448.8	44.9	448.8	142.9
31	506.4	50.6	506.4	78.5	7.6	78.5	6.45	433.6	43.4	433.6	142.7
30	491.4	49.1	491.4	78.3	7.6	78.3	6.28	418.8	41.9	418.8	142.5
29	476.8	47.7	476.8	78.1	7.6	78.1	6.11	404.4	40.4	404.4	142.3
28	462.6	46.3	462.6	77.9	7.6	77.9	5.94	390.3	39.0	390.3	142.0
27	448.8	44.9	448.8	77.7	7.5	77.7	5.77	376.7	37.7	376.7	141.8
26	435.3	43.5	435.3	77.6	7.5	77.6	5.61	363.4	36.3	363.4	141.6
25	422.2	42.2	422.2	77.4	7.5	77.4	5.45	350.4	35.0	350.4	141.5
24	409.5	40.9	409.5	77.2	7.5	77.2	5.30	337.8	33.8	337.8	141.3
23	397.1	39.7	397.1	77.1	7.5	77.1	5.15	325.6	32.6	325.6	141.1
22	385.0	38.5	385.0	76.9	7.5	76.9	5.00	313.7	31.4	313.7	140.9
21	373.3	37.3	373.3	76.8	7.4	76.8	4.86	302.1	30.2	302.1	140.8
20	361.9	36.2	361.9	76.7	7.4	76.7	4.72	290.8	29.1	290.8	140.6
19	350.9	35.1	350.9	76.6	7.4	76.6	4.58	279.9	28.0	279.9	140.5
18	340.2	34.0	340.2	76.4	7.4	76.4	4.45	269.3	26.9	269.3	140.3
17	329.7	33.0	329.7	76.3	7.4	76.3	4.32	258.9	25.9	258.9	140.2
16	319.6	32.0	319.6	76.2	7.4	76.2	4.19	248.9	24.9	248.9	140.1
15	309.8	31.0	309.8	76.1	7.4	76.1	4.07	239.2	23.9	239.2	140.0
14	300.2	30.0	300.2	76.0	7.4	76.0	3.95	229.7	23.0	229.7	139.8
13	291.0	29.1	291.0	75.9	7.4	75.9	3.83	220.6	22.1	220.6	139.7
12	282.0	28.2	282.0	75.8	7.4	75.8	3.72	211.6	21.2	211.6	139.6
11	273.3	27.3	273.3	75.8	7.3	75.8	3.61	203.0	20.3	203.0	139.6
10	264.8	26.5	264.8	75.7	7.3	75.7	3.50	194.6	19.5	194.6	139.5
9	256.6	25.7	256.6	75.6	7.3	75.6	3.39	186.5	18.6	186.5	139.4
8	248.6	24.9	248.6	75.5	7.3	75.5	3.29	178.6	17.9	178.6	139.3
7	240.9	24.1	240.9	75.5	7.3	75.5	3.19	170.9	17.1	170.9	139.3
6	233.4	23.3	233.4	75.4	7.3	75.4	3.09	163.5	16.3	163.5	139.2
5	226.2	22.6	226.2	75.4	7.3	75.4	3.00	156.3	15.6	156.3	139.2
4	219.1	21.9	219.1	75.4	7.3	75.4	2.91	149.3	14.9	149.3	139.1
3	212.3	21.2	212.3	75.3	7.3	75.3	2.82	142.5	14.2	142.5	139.1
2	205.7	20.6	205.7	75.3	7.3	75.3	2.73	135.9	13.6	135.9	139.0
1	199.3	19.9	199.3	75.3	7.3	75.3	2.65	129.5	12.9	129.5	139.0
0	193.0	19.3	193.0	75.3	7.3	75.3	2.57	123.2	12.3	123.2	139.0
-1	187.0	18.7	187.0	75.2	7.3	75.2	2.48	117.2	11.7	117.2	139.0
-2	181.1	18.1	181.1	75.2	7.3	75.2	2.41	111.3	11.1	111.3	139.0
-3	175.4	17.5	175.4	75.2	7.3	75.2	2.33	105.6	10.6	105.6	139.0
-4	169.9	17.0	169.9	75.3	7.3	75.3	2.26	100.1	10.0	100.1	139.0
-5	164.5	16.4	164.5	75.3	7.3	75.3	2.19	94.7	9.5	94.7	139.0

-- attention: operating limits not reflected in performance table

ZR144KRE-TFD_R513A_10_WHR

WAMAK TWW 550 WHR HeavyDuty 2L5

Th -OU	60										
[°C]	Qh nom	Qh min	Qh max	Pin nom	Pin min	Pin max	COP nom	Qc nom	Qc min	Qc max	I nom
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]
45	723.2	72.3	723.2	88.6	8.6	88.6	8.16	641.0	64.1	641.0	155.1
44	703.1	70.3	703.1	88.4	8.6	88.4	7.95	621.1	62.1	621.1	154.8
43	683.4	68.3	683.4	88.2	8.5	88.2	7.75	601.6	60.2	601.6	154.5
42	664.2	66.4	664.2	88.0	8.5	88.0	7.55	582.7	58.3	582.7	154.2
41	645.5	64.6	645.5	87.8	8.5	87.8	7.36	564.1	56.4	564.1	154.0
40	627.3	62.7	627.3	87.5	8.5	87.5	7.16	546.0	54.6	546.0	153.7
39	609.4	60.9	609.4	87.4	8.5	87.4	6.98	528.4	52.8	528.4	153.5
38	592.0	59.2	592.0	87.2	8.5	87.2	6.79	511.2	51.1	511.2	153.3
37	575.1	57.5	575.1	87.0	8.4	87.0	6.61	494.4	49.4	494.4	153.0
36	558.6	55.9	558.6	86.8	8.4	86.8	6.44	478.1	47.8	478.1	152.8
35	542.5	54.2	542.5	86.6	8.4	86.6	6.26	462.1	46.2	462.1	152.6
34	526.8	52.7	526.8	86.4	8.4	86.4	6.09	446.6	44.7	446.6	152.4
33	511.5	51.1	511.5	86.3	8.4	86.3	5.93	431.4	43.1	431.4	152.2
32	496.6	49.7	496.6	86.1	8.4	86.1	5.77	416.7	41.7	416.7	152.0
31	482.1	48.2	482.1	86.0	8.3	86.0	5.61	402.3	40.2	402.3	151.8
30	467.9	46.8	467.9	85.8	8.3	85.8	5.45	388.3	38.8	388.3	151.6
29	454.2	45.4	454.2	85.7	8.3	85.7	5.30	374.7	37.5	374.7	151.5
28	440.8	44.1	440.8	85.5	8.3	85.5	5.15	361.5	36.1	361.5	151.3
27	427.8	42.8	427.8	85.4	8.3	85.4	5.01	348.6	34.9	348.6	151.1
26	415.1	41.5	415.1	85.3	8.3	85.3	4.87	336.0	33.6	336.0	151.0
25	402.8	40.3	402.8	85.2	8.3	85.2	4.73	323.8	32.4	323.8	150.8
24	390.9	39.1	390.9	85.0	8.2	85.0	4.60	312.0	31.2	312.0	150.7
23	379.2	37.9	379.2	84.9	8.2	84.9	4.47	300.5	30.0	300.5	150.6
22	367.9	36.8	367.9	84.8	8.2	84.8	4.34	289.3	28.9	289.3	150.5
21	356.9	35.7	356.9	84.7	8.2	84.7	4.21	278.4	27.8	278.4	150.3
20	346.3	34.6	346.3	84.6	8.2	84.6	4.09	267.8	26.8	267.8	150.2
19	335.9	33.6	335.9	84.5	8.2	84.5	3.97	257.5	25.7	257.5	150.1
18	325.8	32.6	325.8	84.5	8.2	84.5	3.86	247.5	24.8	247.5	150.0
17	316.1	31.6	316.1	84.4	8.2	84.4	3.75	237.8	23.8	237.8	149.9
16	306.6	30.7	306.6	84.3	8.2	84.3	3.64	228.4	22.8	228.4	149.9
15	297.4	29.7	297.4	84.2	8.2	84.2	3.53	219.3	21.9	219.3	149.8
14	288.5	28.8	288.5	84.2	8.2	84.2	3.43	210.4	21.0	210.4	149.7
13	279.8	28.0	279.8	84.1	8.2	84.1	3.33	201.8	20.2	201.8	149.6
12	271.4	27.1	271.4	84.1	8.2	84.1	3.23	193.4	19.3	193.4	149.6
11	263.2	26.3	263.2	84.0	8.1	84.0	3.13	185.3	18.5	185.3	149.5
10	255.3	25.5	255.3	84.0	8.1	84.0	3.04	177.4	17.7	177.4	149.5
9	247.6	24.8	247.6	83.9	8.1	83.9	2.95	169.8	17.0	169.8	149.5
8	240.2	24.0	240.2	83.9	8.1	83.9	2.86	162.4	16.2	162.4	149.4
7	233.0	23.3	233.0	83.9	8.1	83.9	2.78	155.2	15.5	155.2	149.4
6	226.0	22.6	226.0	83.9	8.1	83.9	2.69	148.2	14.8	148.2	149.4
5	219.2	21.9	219.2	83.8	8.1	83.8	2.61	141.4	14.1	141.4	149.4
4	212.6	21.3	212.6	83.8	8.1	83.8	2.54	134.8	13.5	134.8	149.4
3	206.2	20.6	206.2	83.8	8.1	83.8	2.46	128.4	12.8	128.4	149.4
2	200.0	20.0	200.0	83.8	8.1	83.8	2.39	122.2	12.2	122.2	149.4
1	193.9	19.4	193.9	83.8	8.1	83.8	2.31	116.2	11.6	116.2	149.4
0	188.1	18.8	188.1	83.9	8.1	83.9	2.24	110.3	11.0	110.3	149.4
-1											
-2											
-3											
-4											
-5											

-- attention: operating limits not reflected in performance table

WAMAK TWW 550 WHR HeavyDuty 2L5

Th -OU	70										
	°C]										
Ts -IN [°C]	Qh nom [kW]	Qh min [kW]	Qh max [kW]	Pin nom [kW]	Pin min [kW]	Pin max [kW]	COP nom kW / kW	Qc nom [kW]	Qc min [kW]	Qc max [kW]	I nom [A]
45	645.2	64.5	645.2	105.2	10.2	105.2	6.13	547.6	54.8	547.6	176.4
44	627.3	62.7	627.3	105.1	10.2	105.1	5.97	529.8	53.0	529.8	176.2
43	609.9	61.0	609.9	105.0	10.2	105.0	5.81	512.5	51.3	512.5	176.1
42	592.9	59.3	592.9	104.9	10.2	104.9	5.65	495.6	49.6	495.6	175.9
41	576.4	57.6	576.4	104.8	10.2	104.8	5.50	479.2	47.9	479.2	175.8
40	560.3	56.0	560.3	104.7	10.2	104.7	5.35	463.1	46.3	463.1	175.7
39	544.6	54.5	544.6	104.7	10.1	104.7	5.20	447.5	44.7	447.5	175.6
38	529.3	52.9	529.3	104.6	10.1	104.6	5.06	432.2	43.2	432.2	175.5
37	514.3	51.4	514.3	104.5	10.1	104.5	4.92	417.4	41.7	417.4	175.4
36	499.8	50.0	499.8	104.4	10.1	104.4	4.79	403.0	40.3	403.0	175.3
35	485.7	48.6	485.7	104.4	10.1	104.4	4.65	388.9	38.9	388.9	175.2
34	472.0	47.2	472.0	104.3	10.1	104.3	4.52	375.2	37.5	375.2	175.1
33	458.6	45.9	458.6	104.3	10.1	104.3	4.40	361.9	36.2	361.9	175.1
32	445.6	44.6	445.6	104.2	10.1	104.2	4.28	348.9	34.9	348.9	175.0
31	432.9	43.3	432.9	104.1	10.1	104.1	4.16	336.3	33.6	336.3	174.9
30	420.6	42.1	420.6	104.1	10.1	104.1	4.04	324.0	32.4	324.0	174.9
29	408.6	40.9	408.6	104.1	10.1	104.1	3.93	312.1	31.2	312.1	174.8
28	397.0	39.7	397.0	104.0	10.1	104.0	3.82	300.5	30.1	300.5	174.8
27	385.7	38.6	385.7	104.0	10.1	104.0	3.71	289.3	28.9	289.3	174.7
26	374.7	37.5	374.7	104.0	10.1	104.0	3.60	278.3	27.8	278.3	174.7
25	364.1	36.4	364.1	104.0	10.1	104.0	3.50	267.7	26.8	267.7	174.7
24	353.7	35.4	353.7	103.9	10.1	103.9	3.40	257.3	25.7	257.3	174.7
23	343.7	34.4	343.7	103.9	10.1	103.9	3.31	247.3	24.7	247.3	174.7
22	334.0	33.4	334.0	103.9	10.1	103.9	3.21	237.6	23.8	237.6	174.7
21	324.5	32.4	324.5	103.9	10.1	103.9	3.12	228.1	22.8	228.1	174.7
20	315.3	31.5	315.3	103.9	10.1	103.9	3.03	218.9	21.9	218.9	174.7
19	306.4	30.6	306.4	103.9	10.1	103.9	2.95	210.0	21.0	210.0	174.7
18	297.8	29.8	297.8	103.9	10.1	103.9	2.87	201.4	20.1	201.4	174.7
17	289.4	28.9	289.4	103.9	10.1	103.9	2.78	193.0	19.3	193.0	174.7
16	281.3	28.1	281.3	104.0	10.1	104.0	2.71	184.8	18.5	184.8	174.8
15	273.4	27.3	273.4	104.0	10.1	104.0	2.63	176.9	17.7	176.9	174.8
14	265.8	26.6	265.8	104.0	10.1	104.0	2.55	169.3	16.9	169.3	174.8
13	258.3	25.8	258.3	104.0	10.1	104.0	2.48	161.8	16.2	161.8	174.9
12	251.2	25.1	251.2	104.1	10.1	104.1	2.41	154.6	15.5	154.6	174.9
11	244.2	24.4	244.2	104.1	10.1	104.1	2.35	147.6	14.8	147.6	175.0
10	237.5	23.7	237.5	104.2	10.1	104.2	2.28	140.8	14.1	140.8	175.1
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-- attention: operating limits not reflected in performance table

Th -OU	80										
[°C]	Qh nom	Qh min	Qh max	Pin nom	Pin min	Pin max	COP nom	Qc nom	Qc min	Qc max	I nom
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]
45	566.0	56.6	566.0	126.5	12.3	126.5	4.47	448.6	44.9	448.6	205.0
44	550.5	55.1	550.5	126.6	12.3	126.6	4.35	433.1	43.3	433.1	205.1
43	535.4	53.5	535.4	126.6	12.3	126.6	4.23	418.0	41.8	418.0	205.1
42	520.8	52.1	520.8	126.7	12.3	126.7	4.11	403.3	40.3	403.3	205.1
41	506.5	50.7	506.5	126.7	12.3	126.7	4.00	389.0	38.9	389.0	205.2
40	492.6	49.3	492.6	126.8	12.3	126.8	3.89	375.1	37.5	375.1	205.2
39	479.1	47.9	479.1	126.8	12.3	126.8	3.78	361.5	36.2	361.5	205.3
38	466.0	46.6	466.0	126.9	12.3	126.9	3.67	348.3	34.8	348.3	205.4
37	453.2	45.3	453.2	126.9	12.3	126.9	3.57	335.5	33.6	335.5	205.4
36	440.9	44.1	440.9	127.0	12.3	127.0	3.47	323.0	32.3	323.0	205.5
35	428.8	42.9	428.8	127.1	12.3	127.1	3.37	310.9	31.1	310.9	205.6
34	417.1	41.7	417.1	127.2	12.3	127.2	3.28	299.2	29.9	299.2	205.7
33	405.7	40.6	405.7	127.2	12.3	127.2	3.19	287.7	28.8	287.7	205.8
32	394.7	39.5	394.7	127.3	12.3	127.3	3.10	276.6	27.7	276.6	205.9
31	384.0	38.4	384.0	127.4	12.4	127.4	3.01	265.8	26.6	265.8	206.0
30	373.6	37.4	373.6	127.5	12.4	127.5	2.93	255.4	25.5	255.4	206.1
29	363.6	36.4	363.6	127.6	12.4	127.6	2.85	245.2	24.5	245.2	206.2
28	353.8	35.4	353.8	127.7	12.4	127.7	2.77	235.4	23.5	235.4	206.3
27	344.3	34.4	344.3	127.8	12.4	127.8	2.69	225.8	22.6	225.8	206.4
26	335.1	33.5	335.1	127.9	12.4	127.9	2.62	216.5	21.7	216.5	206.6
25	326.2	32.6	326.2	128.0	12.4	128.0	2.55	207.5	20.8	207.5	206.7
24	317.6	31.8	317.6	128.1	12.4	128.1	2.48	198.8	19.9	198.8	206.9
23	309.3	30.9	309.3	128.2	12.4	128.2	2.41	190.3	19.0	190.3	207.0
22	301.2	30.1	301.2	128.3	12.4	128.3	2.35	182.1	18.2	182.1	207.2
21	293.3	29.3	293.3	128.5	12.5	128.5	2.28	174.2	17.4	174.2	207.3
20	285.8	28.6	285.8	128.6	12.5	128.6	2.22	166.5	16.6	166.5	207.5
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-- attention: operating limits not reflected in performance table

WAMAK TWW 550 WHR HeavyDuty 2L5

Tc -OU	W 12 / 7 °C										
[°C]	Qc nom	Qc min	Qc max	Pin nom	Pin min	Pin max	EER	Qh nom	Qh min	Qh max	I nom
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]
40	138.0	13.8	138.0	66.4	6.4	66.4	2.08	199.6	20.0	199.6	128.7
39	140.4	14.0	140.4	65.0	6.3	65.0	2.16	200.7	20.1	200.7	127.2
38	142.8	14.3	142.8	63.7	6.2	63.7	2.24	201.9	20.2	201.9	125.7
37	145.1	14.5	145.1	62.5	6.1	62.5	2.32	203.1	20.3	203.1	124.3
36	147.4	14.7	147.4	61.2	5.9	61.2	2.41	204.2	20.4	204.2	123.0
35	149.7	15.0	149.7	60.0	5.8	60.0	2.49	205.4	20.5	205.4	121.7
34	152.0	15.2	152.0	58.9	5.7	58.9	2.58	206.6	20.7	206.6	120.4
33	154.2	15.4	154.2	57.7	5.6	57.7	2.67	207.8	20.8	207.8	119.2
32	156.5	15.6	156.5	56.6	5.5	56.6	2.76	209.0	20.9	209.0	118.1
31	158.7	15.9	158.7	55.5	5.4	55.5	2.86	210.2	21.0	210.2	117.0
30	160.8	16.1	160.8	54.5	5.3	54.5	2.95	211.4	21.1	211.4	115.9
29	163.0	16.3	163.0	53.5	5.2	53.5	3.05	212.6	21.3	212.6	114.8
28	165.1	16.5	165.1	52.5	5.1	52.5	3.15	213.8	21.4	213.8	113.8
27	167.2	16.7	167.2	51.5	5.0	51.5	3.25	215.0	21.5	215.0	112.9
26	169.3	16.9	169.3	50.6	4.9	50.6	3.35	216.2	21.6	216.2	111.9
25	171.4	17.1	171.4	49.7	4.8	49.7	3.45	217.4	21.7	217.4	111.1
24	173.4	17.3	173.4	48.8	4.7	48.8	3.56	218.6	21.9	218.6	110.2
23	175.4	17.5	175.4	47.9	4.6	47.9	3.66	219.8	22.0	219.8	109.4
22	177.4	17.7	177.4	47.0	4.6	47.0	3.77	221.0	22.1	221.0	108.5
21	179.3	17.9	179.3	46.2	4.5	46.2	3.88	222.2	22.2	222.2	107.8
20	181.3	18.1	181.3	45.4	4.4	45.4	4.00	223.3	22.3	223.3	107.0

Tc [°C]		W 23 / 18 °C									
0 [°C]	Qc nom [kW]	Qc min [kW]	Qc max [kW]	Pin nom [kW]	Pin min [kW]	Pin max [kW]	EER kW / kW	Qh nom [kW]	Qh min [kW]	Qh max [kW]	I nom [A]
40	214.3	21.4	214.3	66.4	6.4	66.4	3.23	276.5	27.6	257.2	129.5
39	217.4	21.7	217.4	65.0	6.3	65.0	3.34	278.4	27.8	259.1	128.0
38	220.6	22.1	220.6	63.7	6.2	63.7	3.46	280.4	28.0	261.0	126.6
37	223.7	22.4	223.7	62.5	6.1	62.5	3.58	282.3	28.2	262.9	125.2
36	226.8	22.7	226.8	61.2	5.9	61.2	3.70	284.3	28.4	264.8	123.9
35	229.8	23.0	229.8	60.0	5.8	60.0	3.83	286.3	28.6	266.7	122.6
34	232.8	23.3	232.8	58.9	5.7	58.9	3.95	288.2	28.8	268.7	121.4
33	235.8	23.6	235.8	57.7	5.6	57.7	4.08	290.2	29.0	270.6	120.2
32	238.7	23.9	238.7	56.6	5.5	56.6	4.22	292.1	29.2	272.6	119.1
31	241.7	24.2	241.7	55.5	5.4	55.5	4.35	294.0	29.4	274.5	117.9
30	244.6	24.5	244.6	54.5	5.3	54.5	4.49	296.0	29.6	276.5	116.9
29	247.4	24.7	247.4	53.5	5.2	53.5	4.63	297.9	29.8	278.4	115.8
28	250.2	25.0	250.2	52.5	5.1	52.5	4.77	299.8	30.0	280.4	114.8
27	253.0	25.3	253.0	51.5	5.0	51.5	4.91	301.7	30.2	282.3	113.8
26	255.8	25.6	255.8	50.6	4.9	50.6	5.06	303.6	30.4	284.3	112.9
25	258.5	25.9	258.5	49.7	4.8	49.7	5.21	305.4	30.5	286.3	112.0
24	261.2	26.1	261.2	48.8	4.7	48.8	5.36	307.3	30.7	288.2	111.1
23	263.9	26.4	263.9	47.9	4.6	47.9	5.51	309.1	30.9	290.2	110.2
22	266.5	26.7	266.5	47.0	4.6	47.0	5.67	310.9	31.1	292.1	109.4
21	269.1	26.9	269.1	46.2	4.5	46.2	5.83	312.8	31.3	294.0	108.6
20	271.7	27.2	271.7	45.4	4.4	45.4	5.99	314.5	31.5	296.0	107.8

-- attention: operating limits not reflected in performance table

LEGEND:

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

