

Hoval Belaria® fit Air/water heat pump

- Air/water heat pump in compact design for outdoor installation
- For heating and cooling in cascades up to 16 machines
- Supporting frame structure with powder coating (RAL 9001)
- External cladding made of surface-coated steel sheet (RAL 9001)
- Hermetically sealed compressors with inverter control
- Copper-soldered plate heat exchanger made of stainless steel with polypropylene insulation and frost protection heating
- Multi-row fin evaporator with large surface area with hydrophilic coating and speed-controlled axial fans
- Filled with refrigerant R32
- Electrical box internally wired ready for connection
- Voltage-free contact for ON/OFF
- Voltage-free contact for summer/winter changeover
- External operator terminal with display and function keys
- The operator terminal can be installed in any room.



Model range

Belaria® fit type	35 °C	Refrigerant	Max. flow °C	Heat output ¹⁾ A2W35 kW	Cooling capacity ¹⁾ A35W18 kW
(53)	A++	R32	54	22.4-53.3	23.7-75.6
(85)	A++	R32	55	38.1-84.8	40.2-119.0

¹⁾ Modulation range

Condensate drain

- It must be ensured that the condensate produced can be absorbed to a sufficient extent by a gravel bed (see configuration and connection diagram).

Hydraulic connections

- Heating connections with supplied Victaulic couplings

Electrical connections

- See installation instructions

TopTronic® E controller (option)

For enabling the Belaria® fit via ON/OFF signal and regulating the plant

Operator terminal

- Operator terminal with graphical display and function keys
- Control and monitoring of the modulating heat pumps
- Setting the heating and cooling curves
- Selection of the operating mode: Standard, Silent and Supersilent
- Display of the current operating parameters
- The operator terminal can be installed in any room.
- Included in the scope of delivery of the Belaria® fit

Air/water heat pump - modulating



Hoval Belaria® fit

Belaria® fit type	Heat output A2W35 kW	Cooling capacity A35W18 kW
(53)	22.4-53.3	23.7-75.6
(85)	38.1-84.8	40.2-119.0

Part No.

7019 107
7019 108

Notice
Corresponding charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0-10 V

See "Circulating pumps"

Energy efficiency class
see "Description"

Notice
A buffer storage tank must be provided. Suitable buffer storage tanks see "Calorifiers" and Engineering Belaria® fit.

Notice
Plants can optionally be installed:

- stand-alone
- with a secondary heat generator
- with a TopTronic® E controller
- with a PLC.

Electric heating elements
see "Calorifiers" - chapter "Electric heating elements"

Accessories



Electrical box
for wall installation in building interiors with built-in Hoval TopTronic® E controller
Integrated control functions for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer
- 1 hot water charging circuit
- Bivalent and cascade management
Can be optionally expanded by max. 1 module expansion and 1 controller module or 2 controller modules:
- Module expansion heating circuit or
- Module expansion heat balancing or
- Module expansion Universal
Can be optionally networked with up to 16 controller modules in total (incl. solar module)
Incl. outdoor sensor, immersion sensor (calorifier sensor), contact sensor (flow temperature sensor) and RAST 5 basic plug set

Part No.

6058 626



Flange set Victaulic MH50-DN50-50
Flange extensions DN 50/PN 6 for attachment of standard flanges to the Victaulic connection pipes
Incl. Victaulic couplings DN 50

6032 293



Welded-on flanges
Version in black
incl. screws and joints.
2x welded-on flanges
Nominal diameter: DN 50
Nominal pressure: PN 6

6041 217



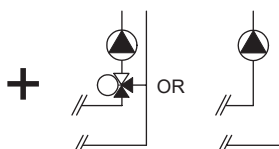
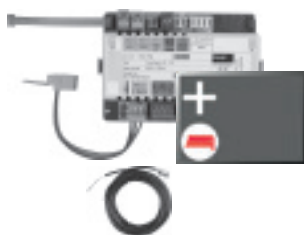
Vibration damper set
for Belaria® fit
for reducing the transmission of solid-borne noise
Consisting of:
- 4 vibration-damping adjustable feet
- 4 threaded rods
Incl. fitting accessories

Type	Version
Belaria® fit (53)	plastic
Belaria® fit (85)	metal springs

6059 770
6059 771

TopTronic® E module expansions

for TopTronic® E basic module heat generator



TopTronic® E module expansion heating circuit TTE-FE HK

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

Consisting of:

- Fitting accessories

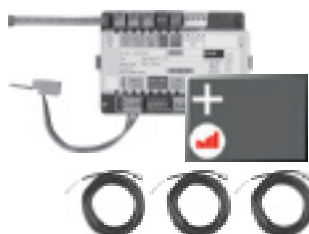
- 1 contact sensor

ALF/2P/4/T, L = 4.0 m

- Basic plug set FE module

Notice

The supplementary plug set may have to be ordered to implement functions differing from the standard!



TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

incl. energy balancing in each case

Consisting of:

- Fitting accessories

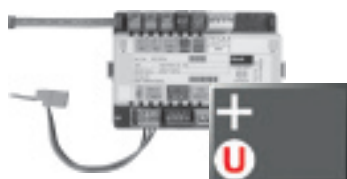
- 3 contact sensors

ALF/2P/4/T, L = 4.0 m

- Plug set FE module

Notice

The flow rate sensor set must be ordered as well.



TopTronic® E module expansion Universal TTE-FE UNI

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

Consisting of:

- Fitting accessories

- Plug set FE module

Notice

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

Further information

see "Controls" - "Hoval TopTronic® E module expansions" chapter

Part No.

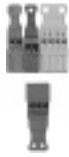
6034 576

6037 062

6034 575

Accessories for TopTronic® E

Part No.



Supplementary plug set

for basic module heat generator TTE-WEZ
for controller modules and module expansion
TTE-FE HK

6034 499
6034 503



TopTronic® E controller modules

TTE-HK/WW TopTronic® E heating circuit/
hot water module
TTE-SOL TopTronic® E solar module
TTE-PS TopTronic® E buffer module
TTE-MWA TopTronic® E measuring module

6034 571
6037 058
6037 057
6034 574



TopTronic® E room control modules

TTE-RBM TopTronic® E room control modules
easy white
comfort white
comfort black

6037 071
6037 069
6037 070



HovalConnect

HovalConnect LAN
HovalConnect WLAN

6049 496
6049 498

TopTronic® E interface modules

GLT module 0-10 V
HovalConnect Modbus
HovalConnect KNX

6034 578
6049 501
6049 593



TopTronic® E wall casing

WG-190 Wall casing small
WG-360 Wall casing medium
WG-360 BM Wall casing medium with
control module cut-out
WG-510 Wall casing large
WG-510 BM Wall casing large with
control module cut-out

6052 983
6052 984
6052 985
6052 986
6052 987



TopTronic® E sensors

AF/2P/K Outdoor sensor
TF/2P/5/6T Immersion sensor, L = 5.0 m
ALF/2P/4/T Contact sensor, L = 4.0 m
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889
2055 888
2056 775
2056 776



System housing

System housing 182 mm
System housing 254 mm

6038 551
6038 552



Bivalent switch

2061 826

Further information

see "Controls"

Accessories



Sludge separator with magnet

BE DN 50...100 FM

Sludge separator with magnet for continuous removal of magnetic and non-magnetic dirt and sludge particles from heating and cooling circuits.

Steel casing (St 37.2)

Sludge separation up to a particle size of 5 µm.

Pipe connection: PN 16, welded-on flange

Max. operating pressure: 10 bar

Max. flow temperature: 110 °C

Type	Connection	Flow rate at 1.5 m/s flow speed m³/h
BE DN050 FM	DN 50	12.5
BE DN065 FM	DN 65	20.0
BE DN080 FM	DN 80	27.0
BE DN100 FM	DN 100	47.0

Part No.

2062 169
2062 170
2062 171
2062 172



Insulations for sludge separator

BE DN 50...100 FM

Type	suitable for sludge separator	Material
TB050	BE050 FM - BE065 FM	PUR
TB080	BE080 FM - BE100 FM	PUR

2050 617
2050 618



System water protection filter FF050-200

Cast-iron casing with opposite connection flanges at same height for filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure loss.

Consisting of:

Casing and cover made of cast iron GGG-50

Cover with clip lock

- Filter strainer insert

made of stainless steel

- Cover seal made of NBR

- 2 magnetic inserts (nickel-neodymium)

- 2 pressure gauges

- Very large filter surface

made of stainless steel

- Filter fineness 200 µm

- With filling and drain valve

- Connections flange DN 50

- Nominal pressure: 10 bar

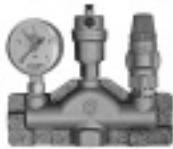
Max. flow rate: ($\Delta p < 0.1$ bar): 18 m³/h

Weight: 15 kg

Water temperature max. 80 °C

2076 376

Accessories



Safety set SG20-1"

Area of application up to 100 kW
complete with safety valve (3 bar)
Pressure gauge and autom.
aspirator with shut-off valve.
Connection: DN 20, 1" internal thread

Part No.

6014 390



Set of vibration decouplers SEK 50-500

for reducing structure-borne noise
from heat pumps in the indoor area
Connections:
Union nut 2" IT (both sides)
Nominal length: 500 mm
Operating pressure at +20 °C: 10 bar
Operating temperature: -40 °C to +100 °C
Material: stainless steel 1.4301
Consisting of:
- 2 vibration decouplers
- 4 flat seals

6053 290

Services



Commissioning

Commissioning by works service or Hoval
trained authorised serviceman/company is
condition for warranty.

For commissioning and other services
please contact your Hoval sales office.

Belaria® fit (53,85)

Type		(53)	(85)
• Energy efficiency class of the compound system with control	35 °C	A++	A++
• Room heating energy efficiency "moderate climate" 35 °C η_S ¹⁾	%	152	159
• Seasonal coefficient of performance moderate climate 35 °C	SCOP	3.87	4.04
Max. performance data heating and cooling in acc. with EN 14511			
• Heat output A2W35	kW	53.3	84.8
• Coefficient of performance A2W35	COP	3.5	3.4
• Heat output A-7W35	kW	40.6	65.9
• Coefficient of performance A-7W35	COP	2.8	2.7
• Cooling capacity A35W18	kW	75.6	119
• Energy efficiency ratio A35W18	EER	3.3	3.3
• Cooling capacity A35W7	kW	55	88.4
• Energy efficiency ratio A35W7	EER	2.6	2.7
Sound data			
• Sound power level "Standard"	dB(A)	82	83
• Sound power level "Silent" ²⁾	dB(A)	74	75
• Sound power level "Supersilent" ²⁾	dB(A)	71	73
Hydraulic data			
• Maximum flow temperature	°C	54	55
• Nominal heating water quantity heating ΔT 5 K (A7W35)	m ³ /h	10.66	16.53
• Nominal heating water quantity heating ΔT 8 K (A7W35)	m ³ /h	6.6	10.3
• Nominal heating water quantity cooling ΔT 4 K (A35W7)	m ³ /h	11.8	19
• Nominal heating water quantity cooling ΔT 4 K (A35W18)	m ³ /h	16.2	25.6
• Max. operating pressure on the heating side	bar	6	6
• Flow/return connection heating	R (ext. thread)	2"	2"
• Built-in fan		2 axial fans	3 axial fans
• Nominal air quantity	m ³ /h	24000	36000
Cooling technical data			
• Refrigerant		R32	R32
• Refrigeration circuits		1	1
• Compressor stages		modulating	modulating
• Refrigerant filling quantity	kg	14	17.5
• Compressor oil filling quantity	l	4.6	6
Electrical data			
• Connections	V/Hz	3~400/50	3~400/50
• Starting current (compressor and fan)	A	40.5	60.2
• Main current fuse	A	50	80
Dimensions/Weight			
• Dimensions (H x W x D)	mm	1320 x 2280 x 1060	1510 x 3300 x 1100
• Weight	kg	530	830

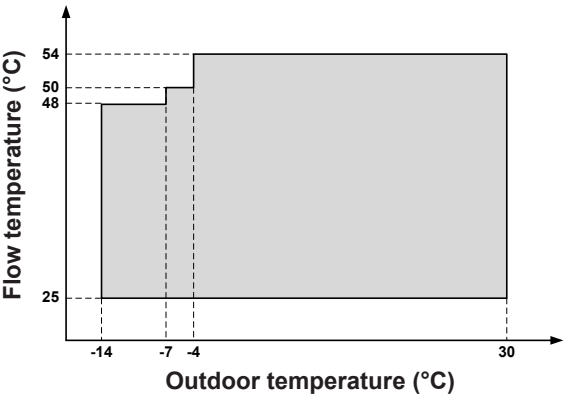
¹⁾ 2 % can be added for class II heat pump incl. control.

²⁾ Reduced heat outputs according to heating performance data

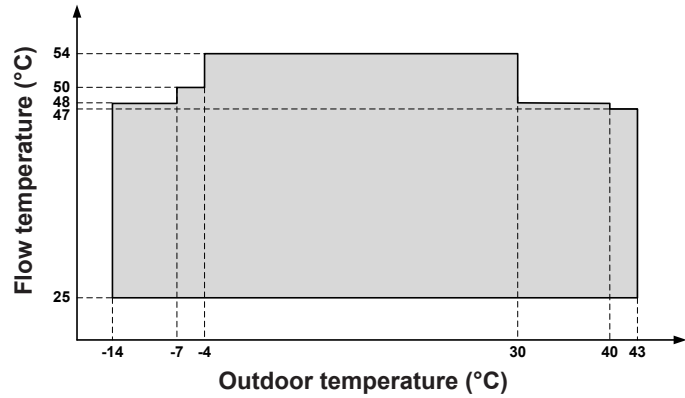
³⁾ Country-specific regulations must be observed. Selection of the fuse size by the electrician.

Diagrams of areas of application

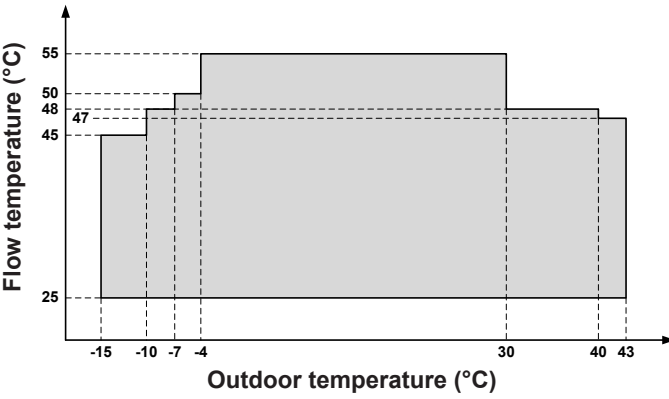
Heating Belaria® fit (53)



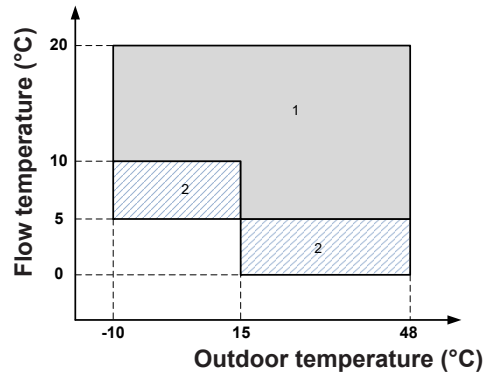
Hot water Belaria® fit (53)



Heating and hot water Belaria® fit (85)



Cooling Belaria® fit (53,85)



- 1 Normal operating range
- 2 Operating range in which the use of ethylene glycol is mandatory

Sound pressure level

Standard Type	Sound pressure level frequency band [Hz]								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Belaria® fit (53)	66	73	76	78	78	74	66	56	65	82
Belaria® fit (85)	88	89	82	76	80	75	69	59	66	83

Silent (low-noise)										
Type	Sound pressure level frequency band [Hz]								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Belaria® fit (53)	58	67	67	69	70	68	60	52	57	74
Belaria® fit (85)	63	68	71	71	71	68	56	58	58	75

In Silent mode, the maximum outputs must be reduced by the correction factor 0.9.

Supersilent (whisper mode)										
Type	Sound pressure level frequency band [Hz]								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Belaria® fit (53)	54	67	63	66	66	65	58	51	54	71
Belaria® fit (85)	55	74	71	68	66	66	64	55	55	73

In Supersilent mode, the maximum outputs must be reduced by the correction factor 0.85.

The sound levels refer to devices with maximum test conditions.

The sound pressure level refers to a distance of 1 meter from the outer surface of the unit during operation in the open.

The noise levels are determined according to the tensiometric method (EN ISO 9614-2).

The data refers to the following conditions in heating mode:

- Water in the internal heat exchanger = 30/35 °C
- Ambient temperature 7 °C

The data refers to the following conditions in cooling mode:

- Water in the internal heat exchanger = 12/7 °C
- Ambient temperature 35 °C

Sound values under maximum conditions

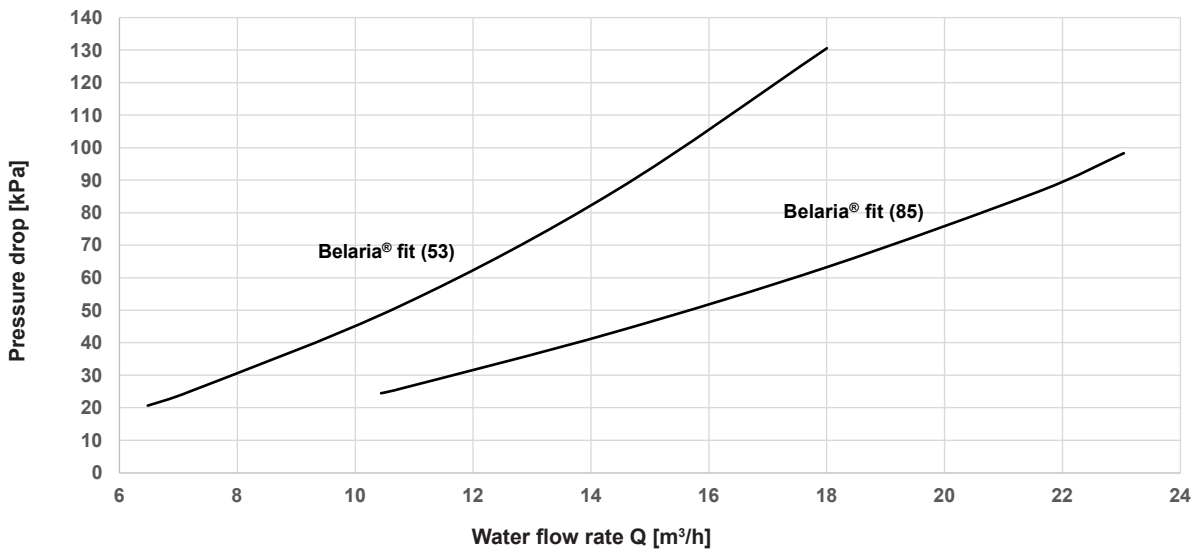
Type	Sound pressure level frequency band [Hz]								Sound pressure level	Sound power level
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Belaria® fit (53)	68	74	79	79	81	76	69	59	67	84
Belaria® fit (85)	88	89	82	76	80	75	69	59	66	84

The sound levels refer to devices with maximum test conditions.

The sound pressure level refers to a distance of 1 meter from the outer surface of the unit during operation in the open.

The noise levels are determined according to the tensiometric method (EN ISO 9614-2).

Pressure drop of the internal heat exchanger



The water pressure drops are calculated assuming an average water temperature of 7 °C.

Permitted water flow rates

		Belaria® fit (53)	Belaria® fit (85)
Minimum flow rate	[m³/h]	6.5	10.4
Maximum flow rate	[m³/h]	18.0	23.0

Correction factors when using glycol

Ethylene glycol percentage by weight %	10	20	30	40	50
Freezing point °C	-4	-9	-16	-23	-37
Correction factor for the refrigerating capacity/heat output of the unit	0.984	0.973	0.965	0.960	0.950
Correction factor for the flow rate	1.019	1.051	1.092	1.145	1.200
Correction factor for the pressure drop in the system	1.118	1.268	4.482	1.791	2.100

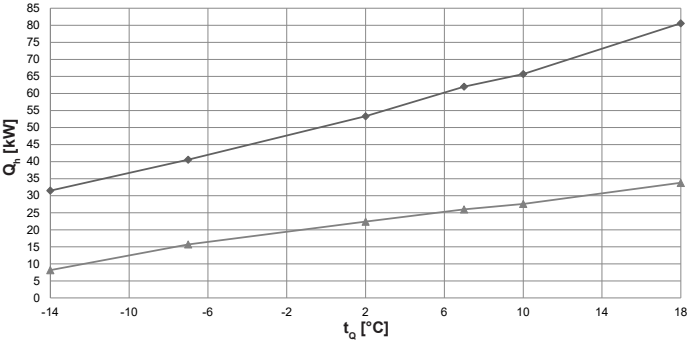
For the exact specifications of the frost protection agent used, refer to the respective manufacturer's data sheet!

Performance data – heating

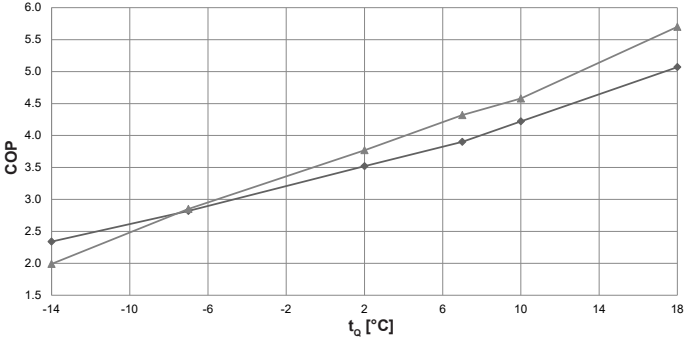
Maximum heat output allowing for defrosting losses

Belaria® fit (53)

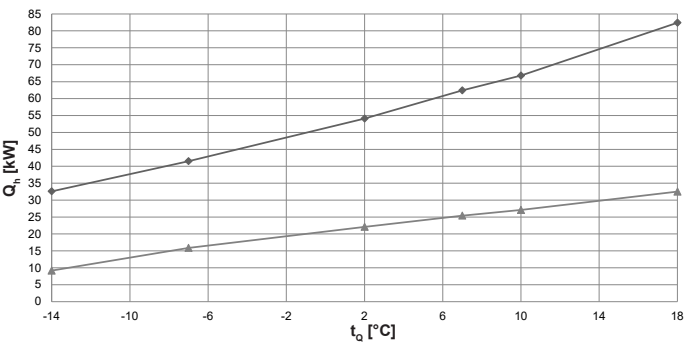
Heat output - t_{VL} 35 °C



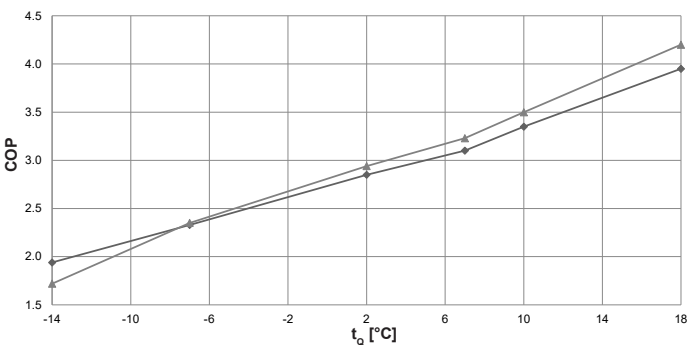
Coefficient of performance - t_{VL} 35 °C



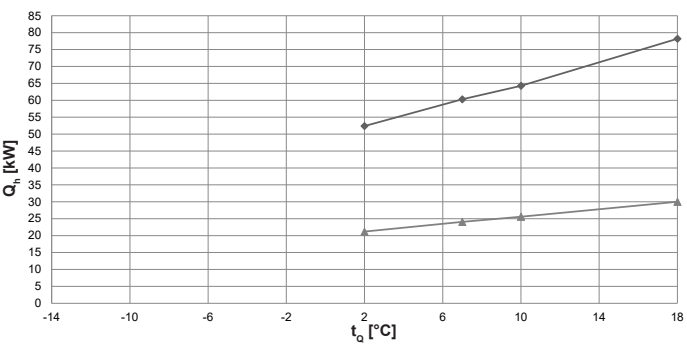
Heat output - t_{VL} 45 °C



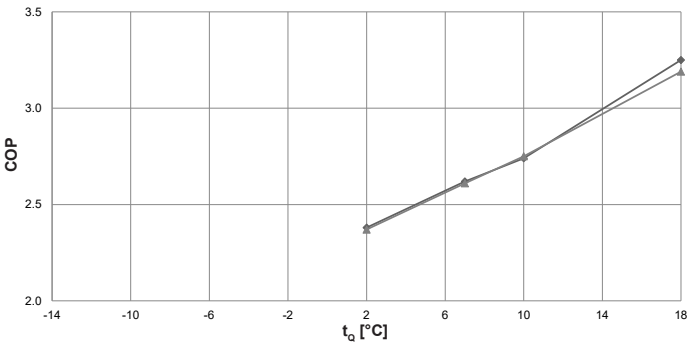
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 54 °C



Coefficient of performance - t_{VL} 54 °C



t_{VL} = heating flow temperature (°C)

t_d = source temperature (°C)

Q_h = heat output at full load (kW), measured in accordance with standard EN 14511

COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

◆ max. output

▲ min. output

Output correction factors in silenced mode

	Silent	Supersilent
Heat output factor	0.92	0.87
Power consumption factor	0.92	0.87
COP factor	1.00	1.00

Performance data – heating

Belaria® fit (53)

Data according to EN 14511

Type	t_{VL} °C	t_Q °C	Maximum output			Minimum output		
			Q_h kW	P kW	COP	Q_h kW	P kW	COP
25	-14		34.0	11.9	2.9	7.9	3.3	2.4
	-7		42.6	12.3	3.5	16.3	4.6	3.5
	2		55.1	12.5	4.4	23.7	4.9	4.8
	7		63.5	12.5	5.1	27.6	4.9	5.6
	10		67.8	12.5	5.4	29.5	4.9	6.0
	18		83.9	12.3	6.8	36.2	4.7	7.7
30	-14		32.6	12.6	2.6	8.0	3.7	2.2
	-7		41.5	13.3	3.1	16.0	5.1	3.2
	2		54.1	13.8	3.9	23.1	5.4	4.3
	7		62.4	13.9	4.5	26.8	5.4	4.9
	10		66.8	14.0	4.8	28.5	5.4	5.2
	18		82.4	14.1	5.9	35.0	5.3	6.6
35	-14		31.5	13.5	2.3	8.2	4.1	2.0
	-7		40.6	14.4	2.8	15.7	5.5	2.9
	2		53.3	15.1	3.5	22.4	5.9	3.8
	7		62.0	15.9	3.9	26.0	6.0	4.3
	10		65.7	15.6	4.2	27.6	6.0	4.6
	18		80.6	15.9	5.1	33.8	5.9	5.7
40	-14		30.5	14.3	2.1	8.4	4.6	1.8
	-7		39.8	15.5	2.6	15.4	6.0	2.6
	2		52.5	16.6	3.2	21.9	6.6	3.3
	7		60.0	16.9	3.6	25.3	6.7	3.8
	10		64.8	17.2	3.8	26.9	6.7	4.0
	18		79.1	17.7	4.5	32.6	6.6	4.9
45	-14		30.8	15.9	1.9	9.2	5.3	1.7
	-7		40.6	17.4	2.3	15.9	6.8	2.4
	2		53.7	18.8	2.9	22.1	7.5	2.9
	7		62.0	20.0	3.1	25.4	7.9	3.2
	10		66.2	19.8	3.4	27.1	7.7	3.5
	18		80.7	20.4	4.0	32.5	7.7	4.2
50	-7		40.0	18.9	2.1	15.9	7.4	2.1
	2		53.0	20.6	2.6	21.6	8.3	2.6
	7		61.1	21.4	2.9	24.7	8.5	2.9
	10		65.1	21.8	3.0	26.2	8.6	3.1
	18		79.3	22.5	3.5	31.1	8.6	3.6
54	2		52.4	22.0	2.4	21.2	8.9	2.4
	7		60.3	23.0	2.6	24.1	9.2	2.6
	10		64.3	23.5	2.7	25.6	9.3	2.8
	18		78.2	24.1	3.3	30.0	9.4	3.2

t_{VL} = heating flow temperature (°C)
 t_Q = source temperature (°C)
 Q_h = heat output at full load (kW), measured in accordance with standard EN 14511
P = power consumption for the overall unit (kW)
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

Output correction factors in silenced mode

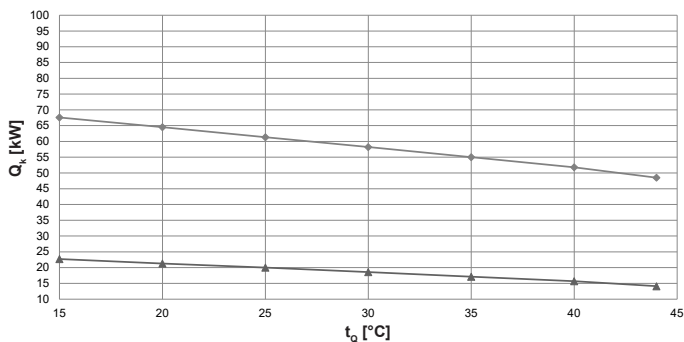
	Silent	Supersilent
Heat output factor	0.92	0.87
Power consumption factor	0.92	0.87
COP factor	1.00	1.00

Performance data - cooling

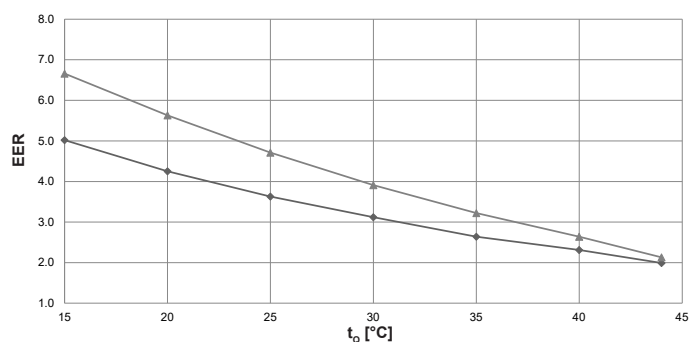
Maximum cooling capacity

Belaria® fit (53)

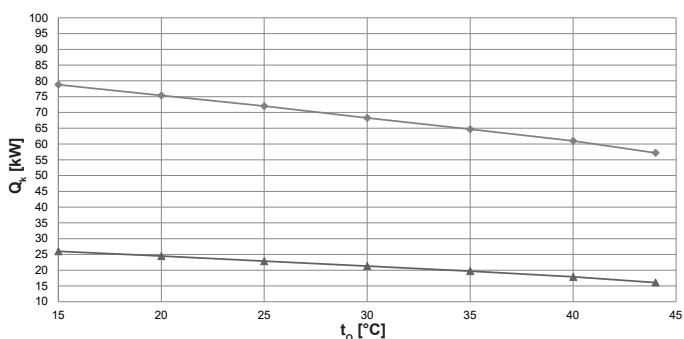
Cooling capacity - $t_{VL} 7\text{ °C}$



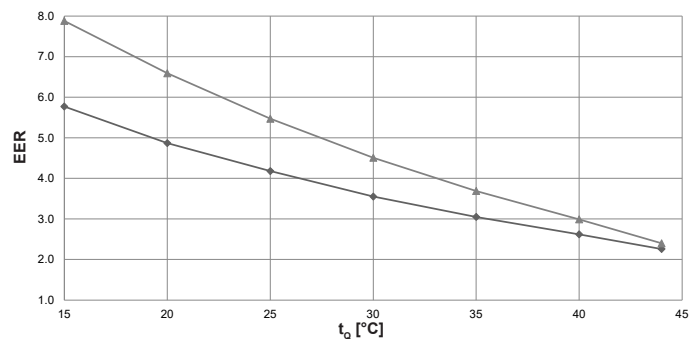
Energy efficiency ratio - $t_{VL} 7\text{ °C}$



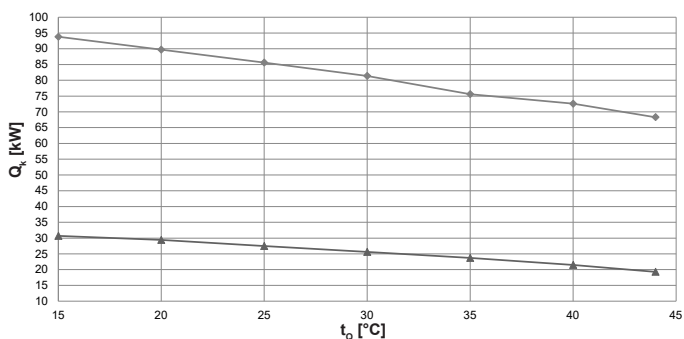
Cooling capacity - $t_{VL} 12\text{ °C}$



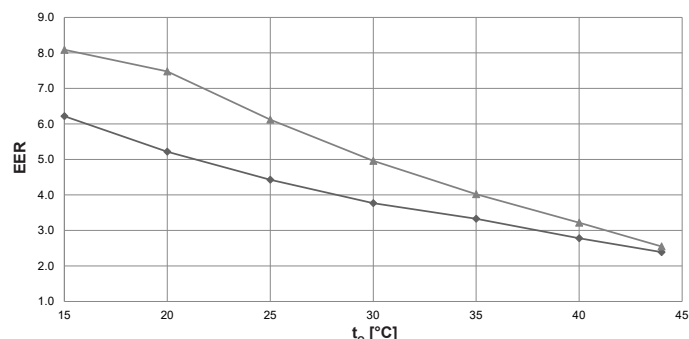
Energy efficiency ratio - $t_{VL} 12\text{ °C}$



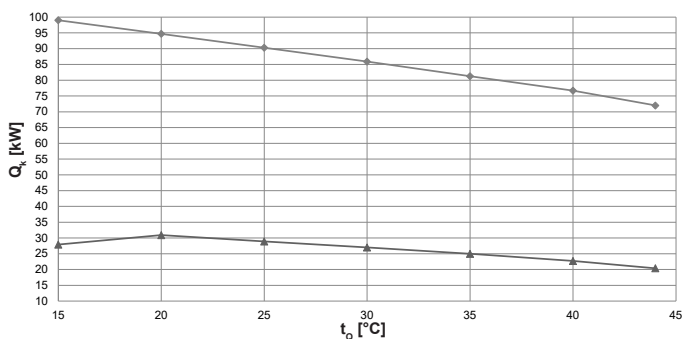
Cooling capacity - $t_{VL} 18\text{ °C}$



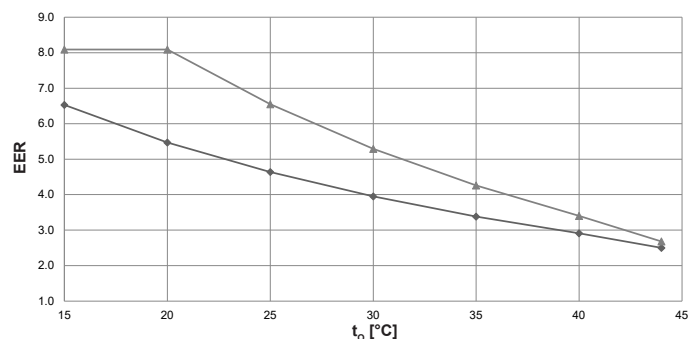
Energy efficiency ratio - $t_{VL} 18\text{ °C}$



Cooling capacity - $t_{VL} 20\text{ °C}$



Energy efficiency ratio - $t_{VL} 20\text{ °C}$


 t_{VL} = cooling water flow temperature (°C)

 t_o = source temperature (°C)

 Q_k = cooling capacity at full load (kW), measured in accordance with standard EN 14511

EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

◆ max. output

▲ min. output

Output correction factors in silenced mode

	Silent	Supersilent
Cooling capacity factor	0.90	0.85
Power consumption factor	1.00	1.00
EER factor	0.90	0.85

Performance data – cooling

Belaria® fit (53)

Data according to EN 14511

Type	t_{VL} °C	t_Q °C	Maximum output			Minimum output		
			Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15		67.6	13.5	5.0	22.7	3.4	6.7
	20		64.5	15.2	4.3	21.3	3.8	5.6
	25		61.3	16.9	3.6	20.0	4.2	4.7
	30		58.2	18.7	3.1	18.6	4.8	3.9
	35		55.0	20.8	2.6	17.1	5.3	3.2
	40		51.8	22.4	2.3	15.7	5.9	2.6
	44		48.5	24.4	2.0	14.1	6.6	2.1
10	15		74.2	13.6	5.5	24.6	3.4	7.3
	20		70.9	15.3	4.6	23.2	3.7	6.2
	25		67.6	17.2	3.9	21.7	4.2	5.2
	30		64.2	19.0	3.4	20.2	4.7	4.3
	35		60.7	20.9	2.9	18.6	5.3	3.5
	40		57.2	22.9	2.5	17.0	6.0	2.9
	44		53.7	25.0	2.2	15.3	6.7	2.3
12	15		78.8	13.7	5.8	26.0	3.3	7.9
	20		75.4	15.5	4.9	24.5	3.7	6.6
	25		72.0	17.2	4.2	22.9	4.2	5.5
	30		68.3	19.2	3.6	21.3	4.7	4.5
	35		64.7	21.2	3.1	19.7	5.3	3.7
	40		61.0	23.3	2.6	17.9	6.0	3.0
	44		57.2	25.3	2.3	16.1	6.7	2.4
15	15		86.2	13.8	6.3	28.0	3.2	8.8
	20		82.4	15.7	5.3	26.4	3.6	7.3
	25		78.6	17.5	4.5	24.7	4.1	6.0
	30		74.7	19.6	3.8	23.0	4.7	4.9
	35		70.7	21.6	3.3	21.2	5.3	4.0
	40		66.8	23.7	2.8	19.3	6.0	3.2
	44		62.7	25.8	2.4	17.3	6.7	2.6
18	15		93.8	15.1	6.2	30.7	3.8	8.1
	20		89.7	17.2	5.2	29.4	3.9	7.5
	25		85.6	19.3	4.4	27.5	4.5	6.1
	30		81.4	21.6	3.8	25.6	5.2	5.0
	35		75.6	22.7	3.3	23.7	5.9	4.0
	40		72.6	26.1	2.8	21.5	6.7	3.2
	44		68.3	28.6	2.4	19.3	7.6	2.6
20	15		99.0	15.2	6.5	27.9	3.4	8.1
	20		94.7	17.3	5.5	30.9	3.8	8.1
	25		90.3	19.5	4.6	28.9	4.4	6.6
	30		85.9	21.7	4.0	27.0	5.1	5.3
	35		81.3	24.1	3.4	25.0	5.9	4.3
	40		76.7	26.4	2.9	22.7	6.7	3.4
	44		72.0	28.8	2.5	20.4	7.6	2.7

t_{VL} = cooling water flow temperature (°C)
 t_Q = source temperature (°C)
 Q_k = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption for the overall unit (kW)
EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

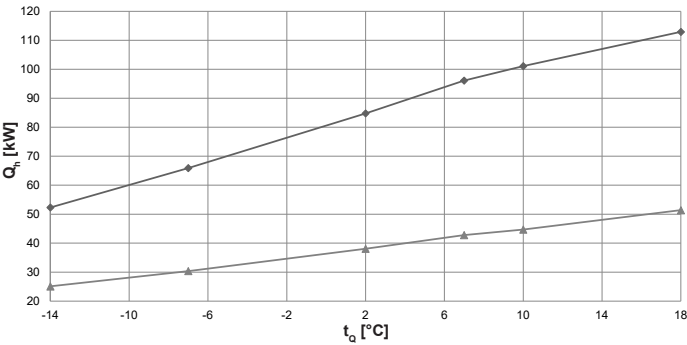
Output correction factors in silenced mode

	Silent	Supersilent
Cooling capacity factor	0.90	0.85
Power consumption factor	1.00	1.00
EER factor	0.90	0.85

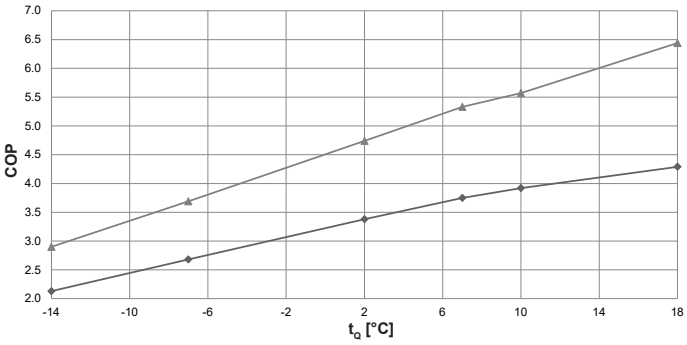
Performance data – heating
Maximum heat output allowing for defrosting losses

Belaria® fit (85)

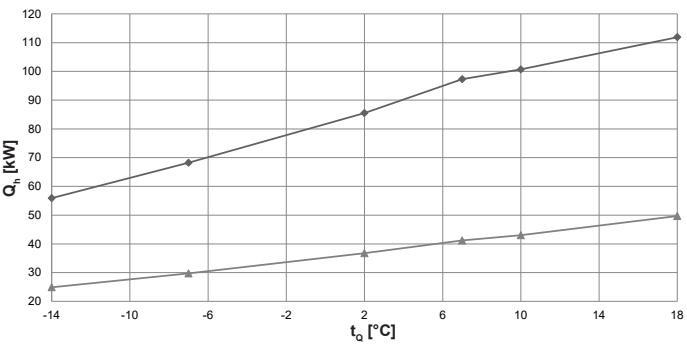
Heat output - t_{VL} 35 °C



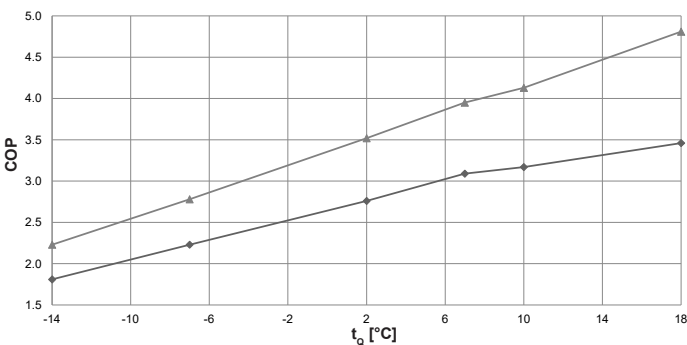
Coefficient of performance - t_{VL} 35 °C



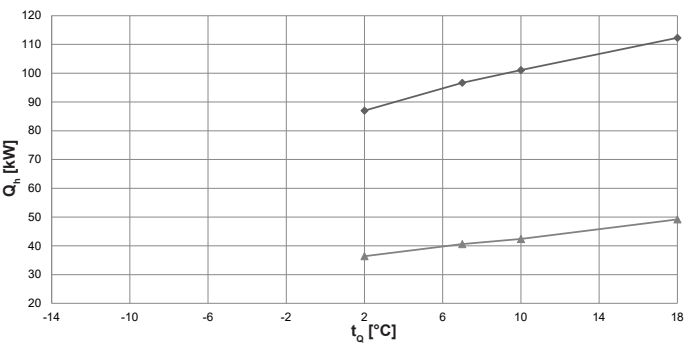
Heat output - t_{VL} 45 °C



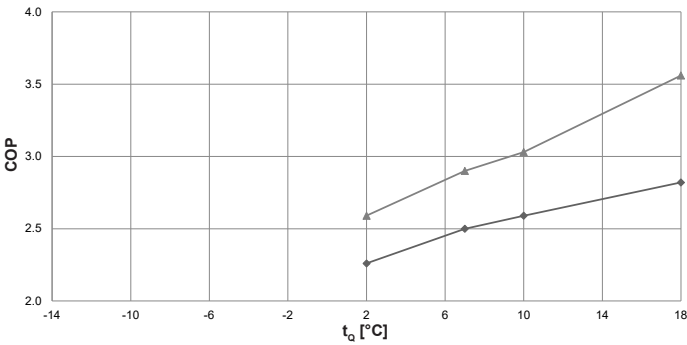
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 54 °C



Coefficient of performance - t_{VL} 54 °C



t_{VL} = heating flow temperature (°C)
 t_o = source temperature (°C)
 Q_h = heat output at full load (kW), measured in accordance with standard EN 14511
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

◆ max. output
▲ min. output

Output correction factors in silenced mode

	Silent	Supersilent
Heat output factor	0.95	0.90
Power consumption factor	0.95	0.90
COP factor	1.00	1.00

Performance data – heating

Belaria® fit (85)

Data according to EN 14511

Type	t_{VL} °C	t_Q °C	Maximum output			Minimum output		
			Q_h kW	P kW	COP	Q_h kW	P kW	COP
25	-14		49.1	19.3	2.6	25.8	7.3	3.6
	-7		64.2	19.8	3.3	31.7	6.9	4.6
	2		84.7	20.5	4.1	40.2	6.7	6.0
	7		96.9	20.9	4.6	45.3	6.8	6.7
	10		102.2	21.1	4.8	47.4	6.8	7.0
	18		114.9	21.6	5.3	54.2	6.7	8.1
30	-14		50.6	21.7	2.3	29.8	9.2	3.2
	-7		65.0	22.0	3.0	36.9	8.8	4.2
	2		84.7	22.6	3.7	47.4	8.8	5.4
	7		96.4	23.1	4.2	53.6	8.8	6.1
	10		101.5	23.3	4.4	56.2	8.9	6.3
	18		113.8	23.8	4.8	63.6	8.7	7.3
35	-14		52.3	24.6	2.1	25.1	8.7	2.9
	-7		65.9	24.6	2.7	30.4	8.2	3.7
	2		84.8	25.1	3.4	38.1	8.0	4.7
	7		96.1	25.6	3.8	42.8	8.0	5.3
	10		101.1	25.8	3.9	44.7	8.0	5.6
	18		112.9	26.3	4.3	51.4	8.0	6.4
40	-14		54.0	27.6	2.0	25.0	9.8	2.6
	-7		67.0	27.5	2.4	30.0	9.3	3.2
	2		85.0	27.8	3.1	37.3	9.1	4.1
	7		96.0	28.3	3.4	41.9	9.1	4.6
	10		100.8	28.6	3.5	43.8	9.1	4.8
	18		112.4	29.0	3.9	50.4	9.0	5.6
45	-14		55.9	30.9	1.8	24.9	11.2	2.2
	-7		68.2	30.6	2.2	29.7	10.7	2.8
	2		85.5	31.0	2.8	36.8	10.5	3.5
	7		97.3	31.5	3.1	41.2	10.4	4.0
	10		100.7	31.8	3.2	43.0	10.4	4.1
	18		111.9	32.3	3.5	49.7	10.3	4.8
50	-7		69.5	34.1	2.0	29.6	12.3	2.4
	2		86.2	34.5	2.5	36.5	12.1	3.0
	7		96.4	35.1	2.8	40.8	12.1	3.4
	10		100.9	35.4	2.9	42.6	12.1	3.5
	18		112.1	36.0	3.1	49.3	11.9	4.1
54	2		87.0	38.5	2.3	36.4	14.1	2.6
	7		96.7	38.7	2.5	40.6	14.0	2.9
	10		101.1	39.0	2.6	42.4	14.0	3.0
	18		112.3	39.8	2.8	49.2	13.8	3.6

t_{VL} = heating flow temperature (°C)
 t_Q = source temperature (°C)
 Q_h = heat output at full load (kW), measured in accordance with standard EN 14511
P = power consumption for the overall unit (kW)
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

Output correction factors in silenced mode

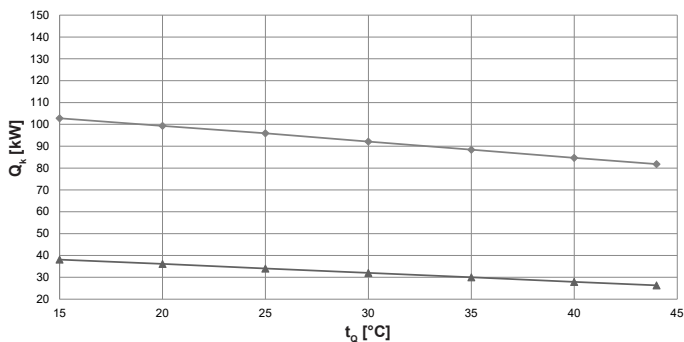
	Silent	Supersilent
Heat output factor	0.95	0.90
Power consumption factor	0.95	0.90
COP factor	1.00	1.00

Performance data - cooling

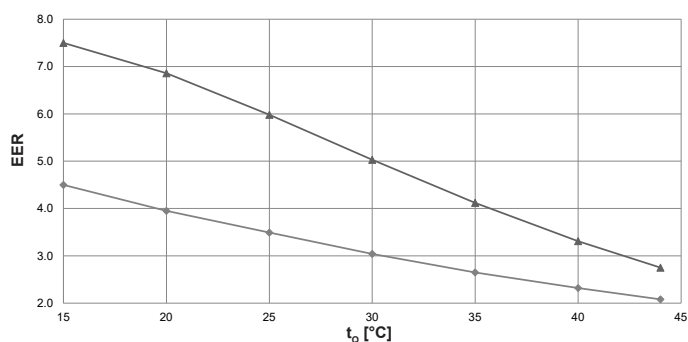
Maximum cooling capacity

Belaria® fit (85)

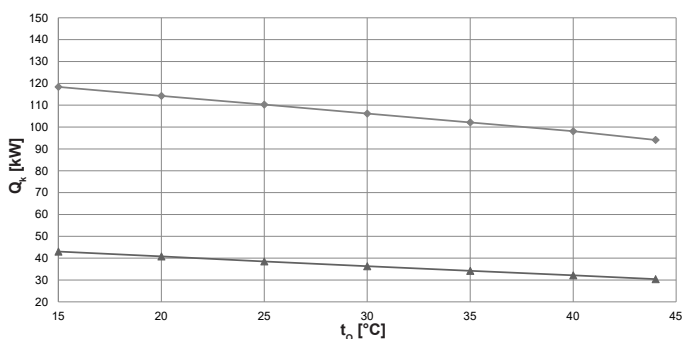
Cooling capacity - $t_{VL} 7\text{ °C}$



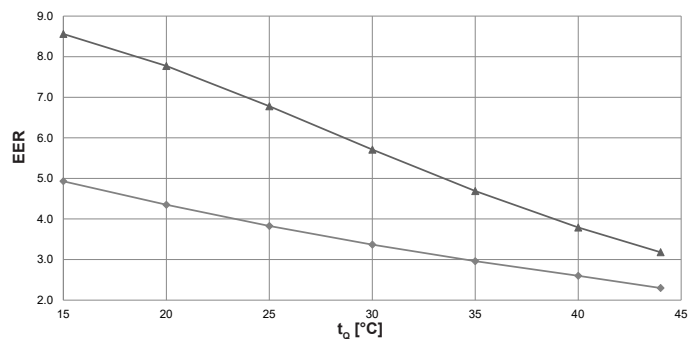
Energy efficiency ratio - $t_{VL} 7\text{ °C}$



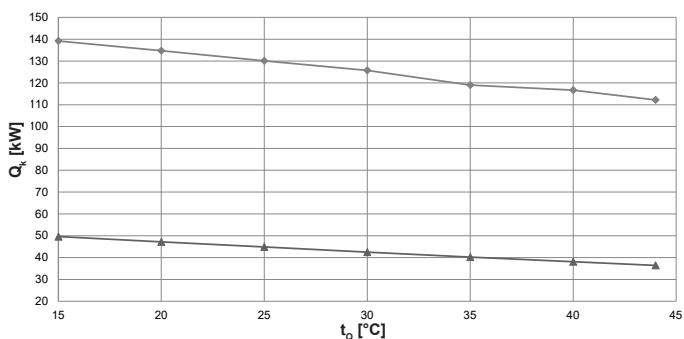
Cooling capacity - $t_{VL} 12\text{ °C}$



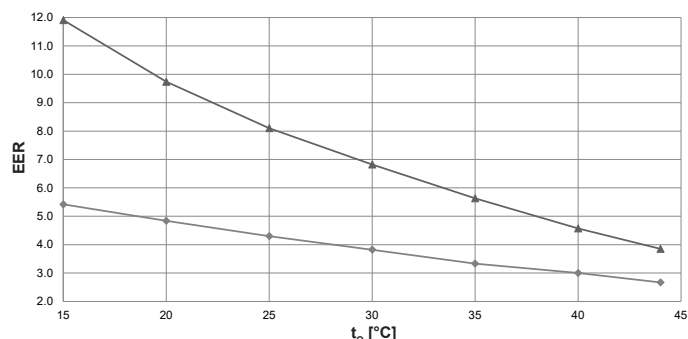
Energy efficiency ratio - $t_{VL} 12\text{ °C}$



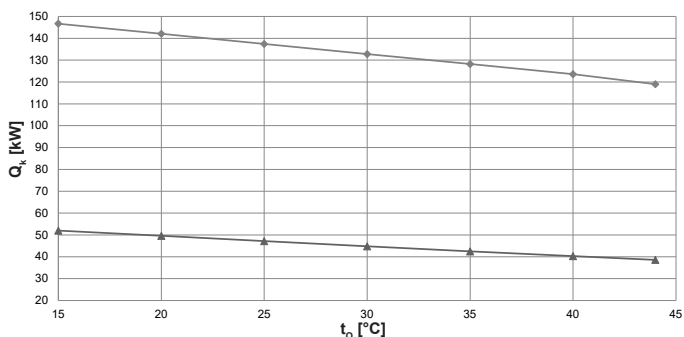
Cooling capacity - $t_{VL} 18\text{ °C}$



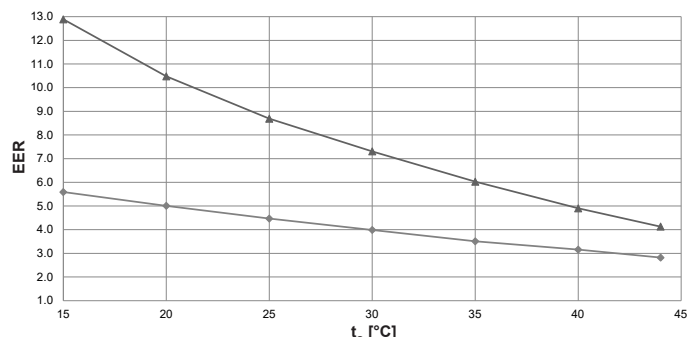
Energy efficiency ratio - $t_{VL} 18\text{ °C}$



Cooling capacity - $t_{VL} 20\text{ °C}$



Energy efficiency ratio - $t_{VL} 20\text{ °C}$


 t_{VL} = cooling water flow temperature (°C)

 t_o = source temperature (°C)

 Q_k = cooling capacity at full load (kW), measured in accordance with standard EN 14511

EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

◆ max. output

▲ min. output

Output correction factors in silenced mode

	Silent	Supersilent
Cooling capacity factor	0.93	0.88
Power consumption factor	1.02	1.02
EER factor	0.93	0.86

Performance data – cooling

Belaria® fit (85)

Data according to EN 14511

Type	t_{VL} °C	t_Q °C	Maximum output			Minimum output		
			Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15		102.8	22.8	4.5	38.1	5.1	7.5
	20		99.3	25.1	4.0	36.1	5.3	6.9
	25		95.9	27.5	3.5	34.0	5.7	6.0
	30		92.1	30.3	3.0	32.0	6.4	5.0
	35		88.4	33.4	2.7	30.0	7.3	4.1
	40		84.7	36.5	2.3	27.9	8.4	3.3
	44		81.8	39.3	2.1	26.3	9.6	2.8
10	15		112.0	23.5	4.8	41.0	5.1	8.1
	20		108.1	25.8	4.2	38.8	5.3	7.4
	25		104.3	28.3	3.7	36.7	5.7	6.4
	30		100.4	31.1	3.2	34.5	6.4	5.4
	35		96.5	34.1	2.8	32.4	7.3	4.5
	40		92.6	37.3	2.5	30.3	8.5	3.6
	44		89.4	44.2	2.0	28.7	9.6	3.0
12	15		118.4	24.0	4.9	43.0	5.0	8.6
	20		114.3	26.3	4.4	40.8	5.3	7.8
	25		110.3	28.8	3.8	38.5	5.7	6.8
	30		106.2	31.5	3.4	36.3	6.4	5.7
	35		102.1	34.5	3.0	34.2	7.3	4.7
	40		98.1	37.7	2.6	32.1	8.5	3.8
	44		94.1	40.9	2.3	30.4	9.6	3.2
15	15		128.5	24.8	5.2	46.2	4.7	9.8
	20		124.2	27.1	4.6	43.9	5.2	8.5
	25		119.9	29.5	4.1	41.6	5.6	7.4
	30		115.6	32.3	3.6	39.3	6.3	6.2
	35		111.3	35.2	3.2	37.1	7.2	5.1
	40		106.9	38.3	2.8	34.9	8.4	4.1
	44		102.6	41.5	2.5	33.3	9.6	3.5
18	15		139.2	25.7	5.4	49.6	4.2	11.9
	20		134.7	27.8	4.8	47.2	4.8	9.7
	25		130.1	30.3	4.3	44.9	5.5	8.1
	30		125.7	32.9	3.8	42.5	6.2	6.8
	35		119.0	35.7	3.3	40.2	7.1	5.6
	40		116.7	38.9	3.0	38.1	8.3	4.6
	44		112.2	42.0	2.7	36.4	9.5	3.9
20	15		146.7	26.2	5.6	52.0	4.0	12.9
	20		142.1	28.4	5.0	49.6	4.7	10.5
	25		137.4	30.7	4.5	47.2	5.4	8.7
	30		132.8	33.3	4.0	44.8	6.1	7.3
	35		128.2	36.5	3.5	42.5	7.0	6.0
	40		123.6	39.1	3.2	40.3	8.2	4.9
	44		119.0	42.2	2.8	38.6	9.3	4.1

t_{VL} = cooling water flow temperature (°C)
 t_Q = source temperature (°C)
 Q_k = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption for the overall unit (kW)
EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

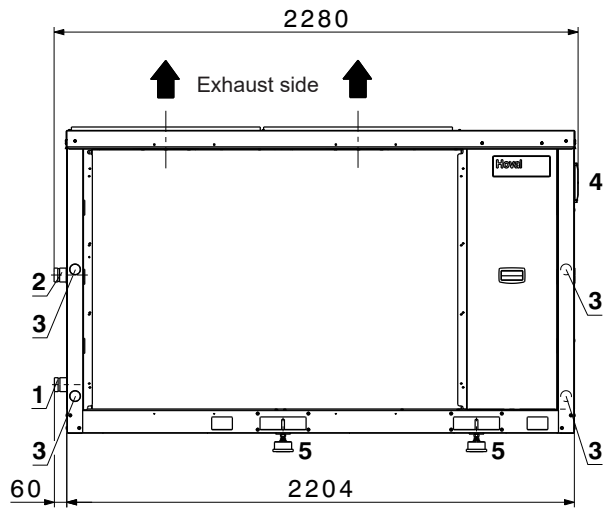
Output correction factors in silenced mode

	Silent	Supersilent
Cooling capacity factor	0.93	0.88
Power consumption factor	1.02	1.02
EER factor	0.93	0.86

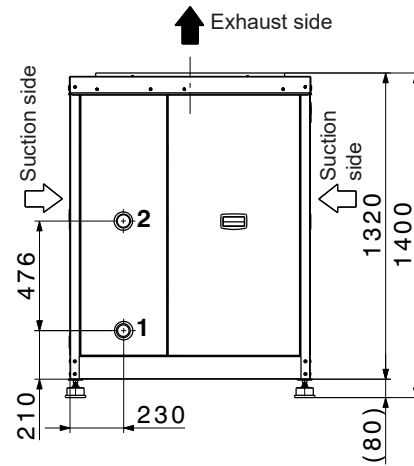
Belaria® fit (53)

(Dimensions in mm)

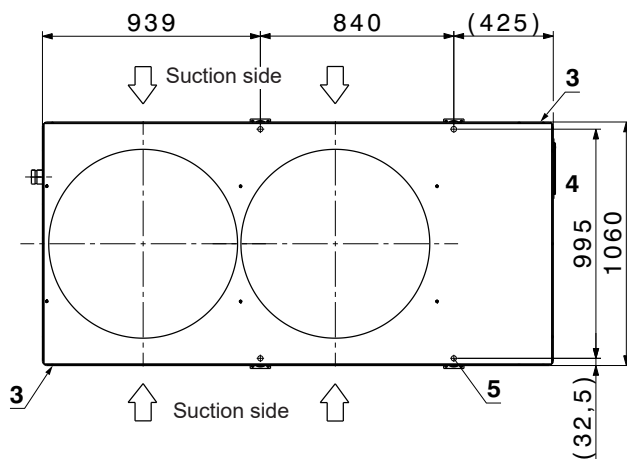
Front view (exhaust side)



Side view



Rear (suction side)

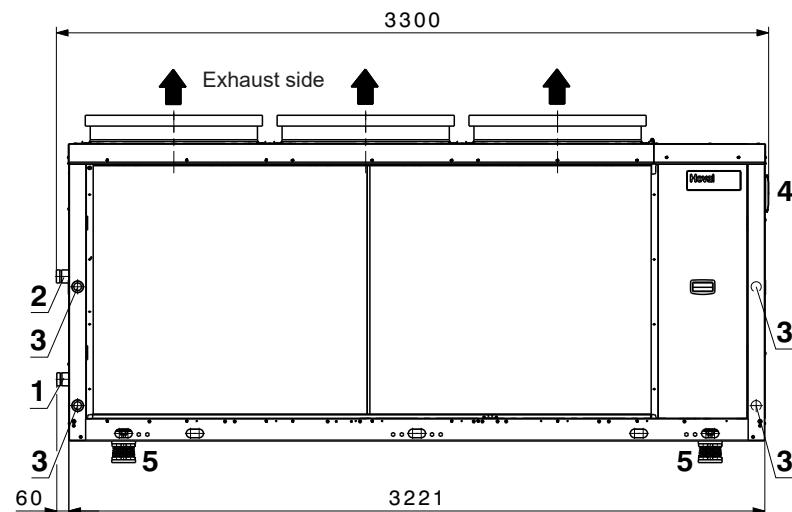


- 1 Flow heating DN 50
- 2 Return heating DN 50
- 3 Electrical connection
- 4 Control module bracket
- 5 Vibration dampers

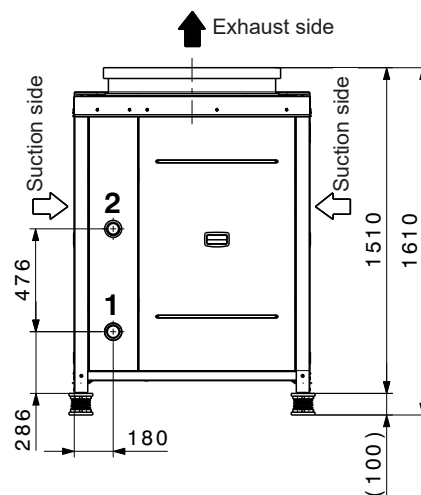
Belaria® fit (85)

(Dimensions in mm)

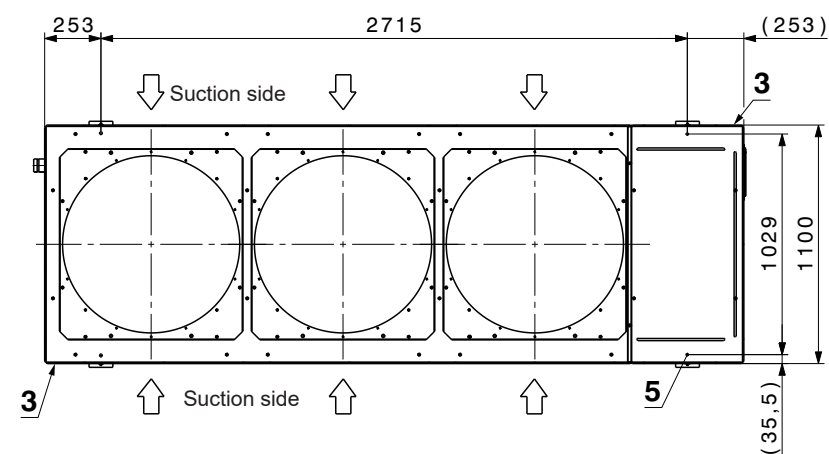
Front view (exhaust side)



Side view

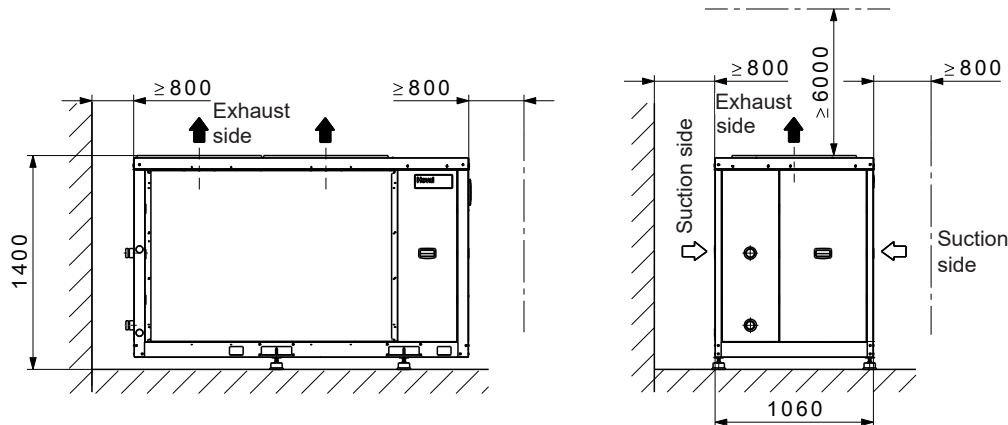


Rear (suction side)

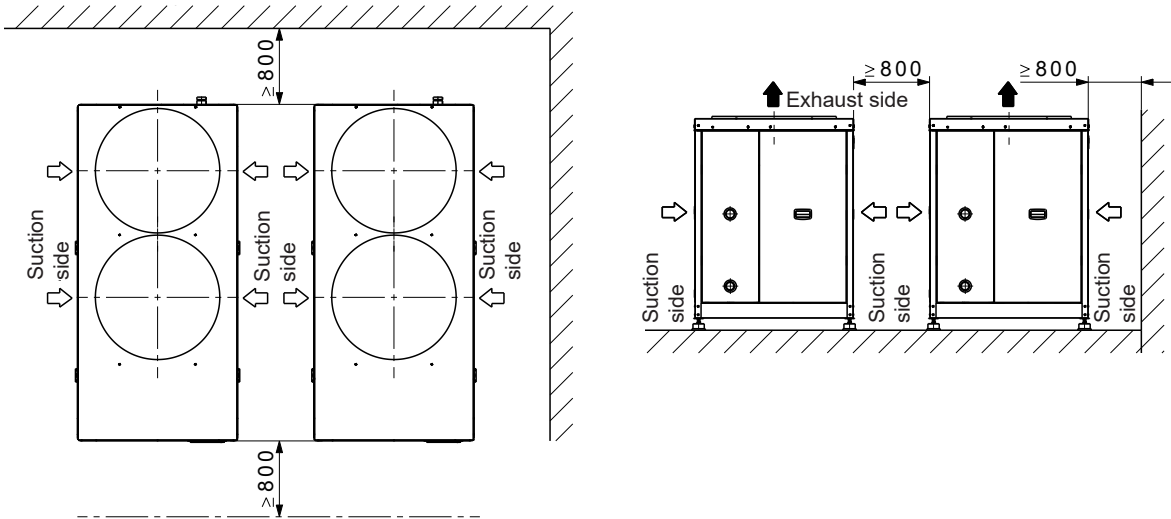
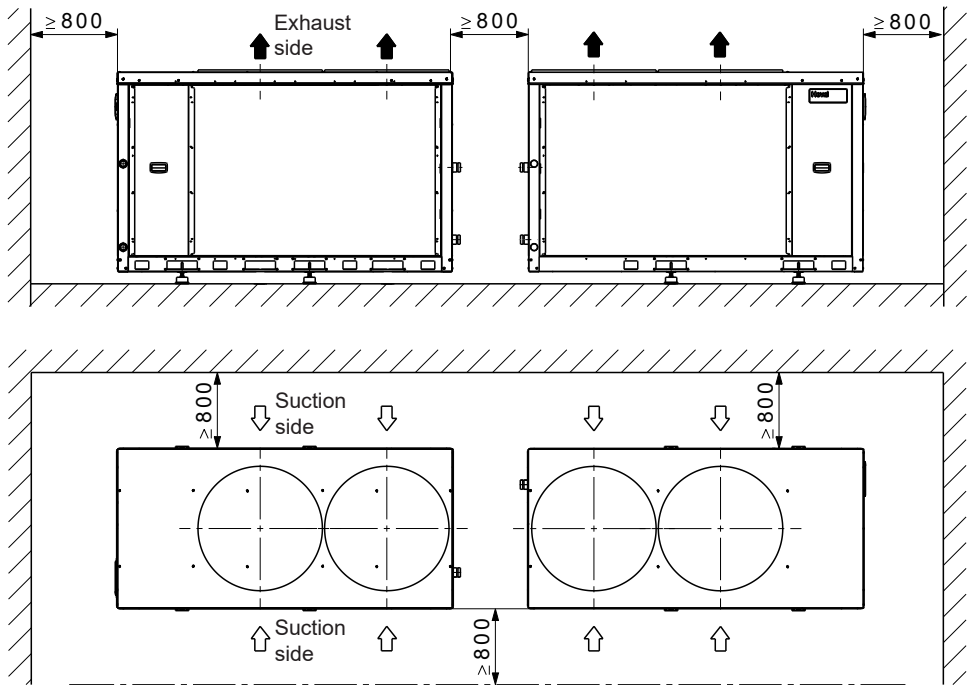


- 1 Flow heating DN 50
- 2 Return heating DN 50
- 3 Electrical connection
- 4 Control module bracket
- 5 Vibration dampers

Space requirement Belaria® fit (53)
(Dimensions in mm)

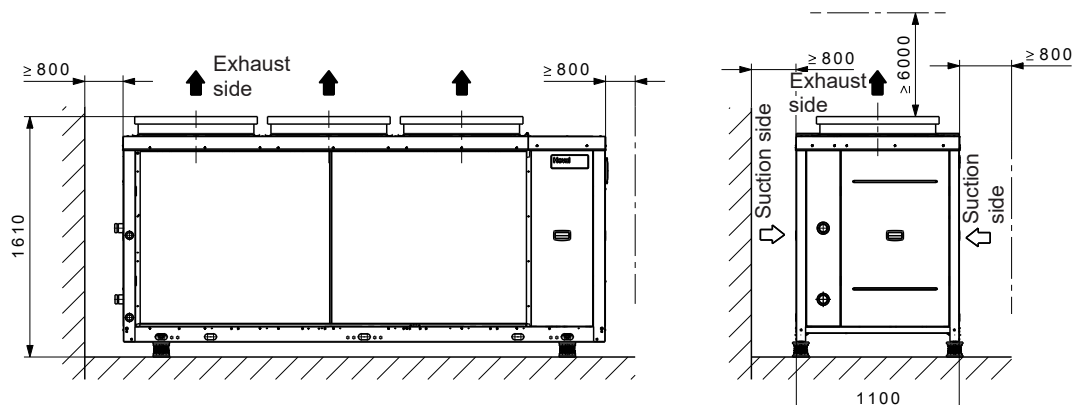


Minimum distances for cascade systems Belaria® fit (53)
(Dimensions in mm)



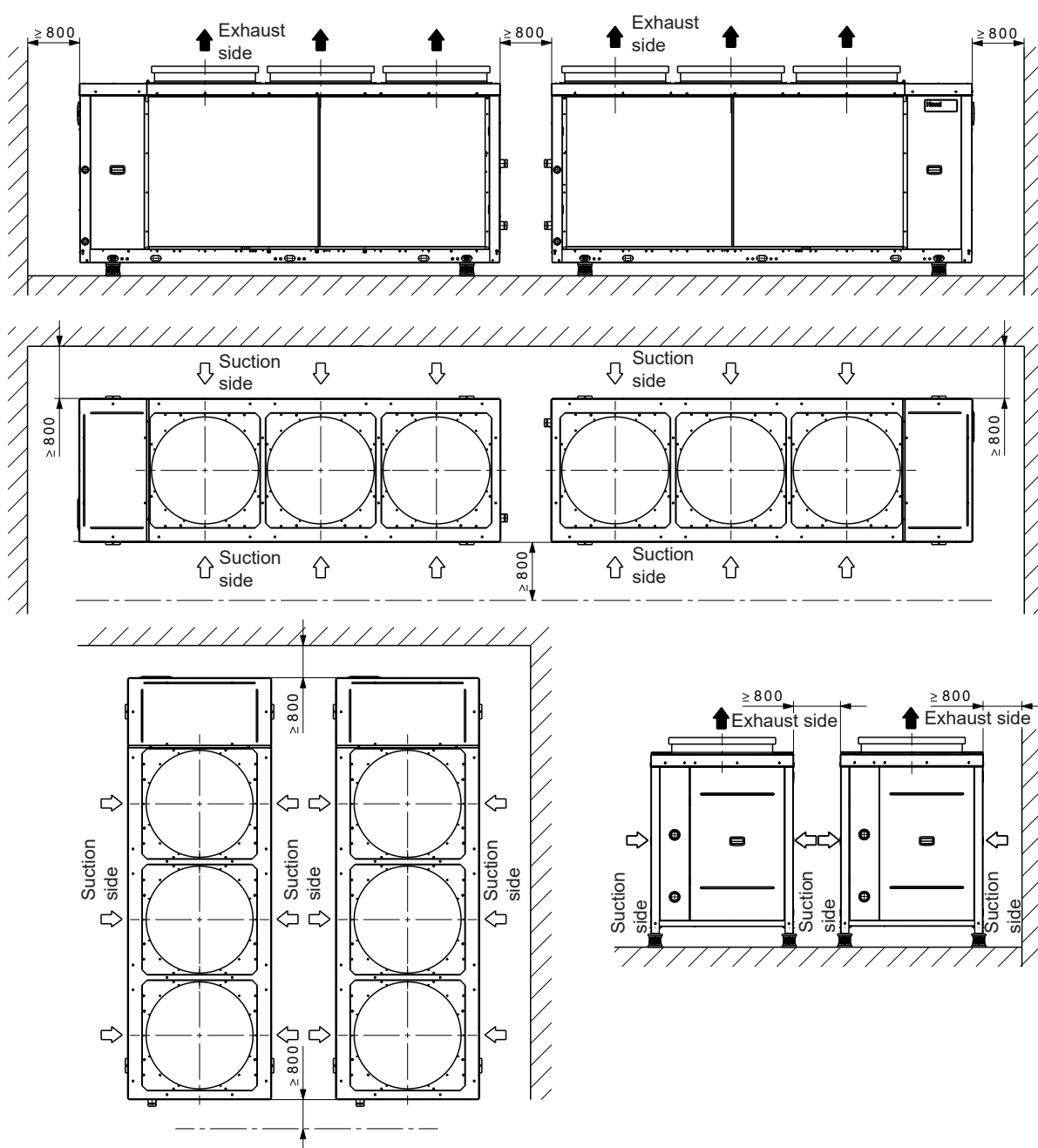
Space requirement Belaria® fit (85)

(Dimensions in mm)



Minimum distances for cascade systems Belaria® fit (85)

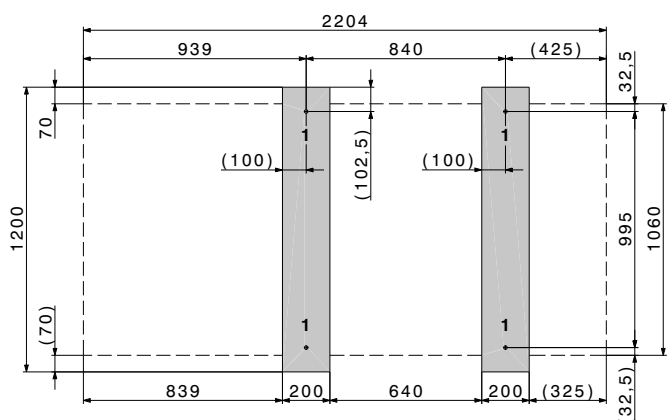
(Dimensions in mm)



Base design Belaria® fit (53)

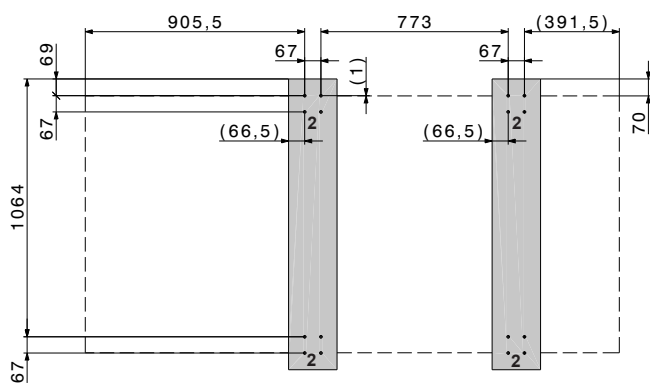
(Dimensions in mm)

Base plan feet



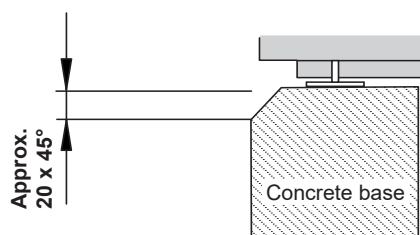
- 1 Hole for attachment of the heat pump M12

Base plan set of vibration-damping feet



- 2 Holes for vibration-damping adjustable feet

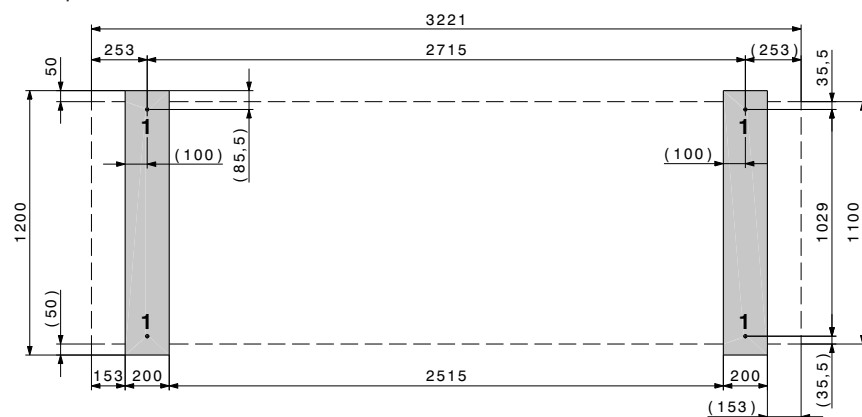
The concrete base must have a level surface the size of the Belaria® fit. The base should have chamfered edges.



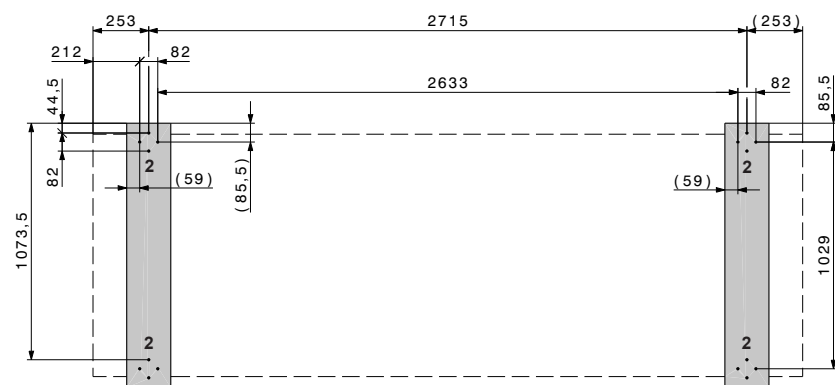
Base design Belaria® fit (85)

(Dimensions in mm)

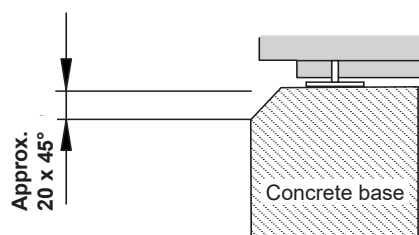
Base plan feet



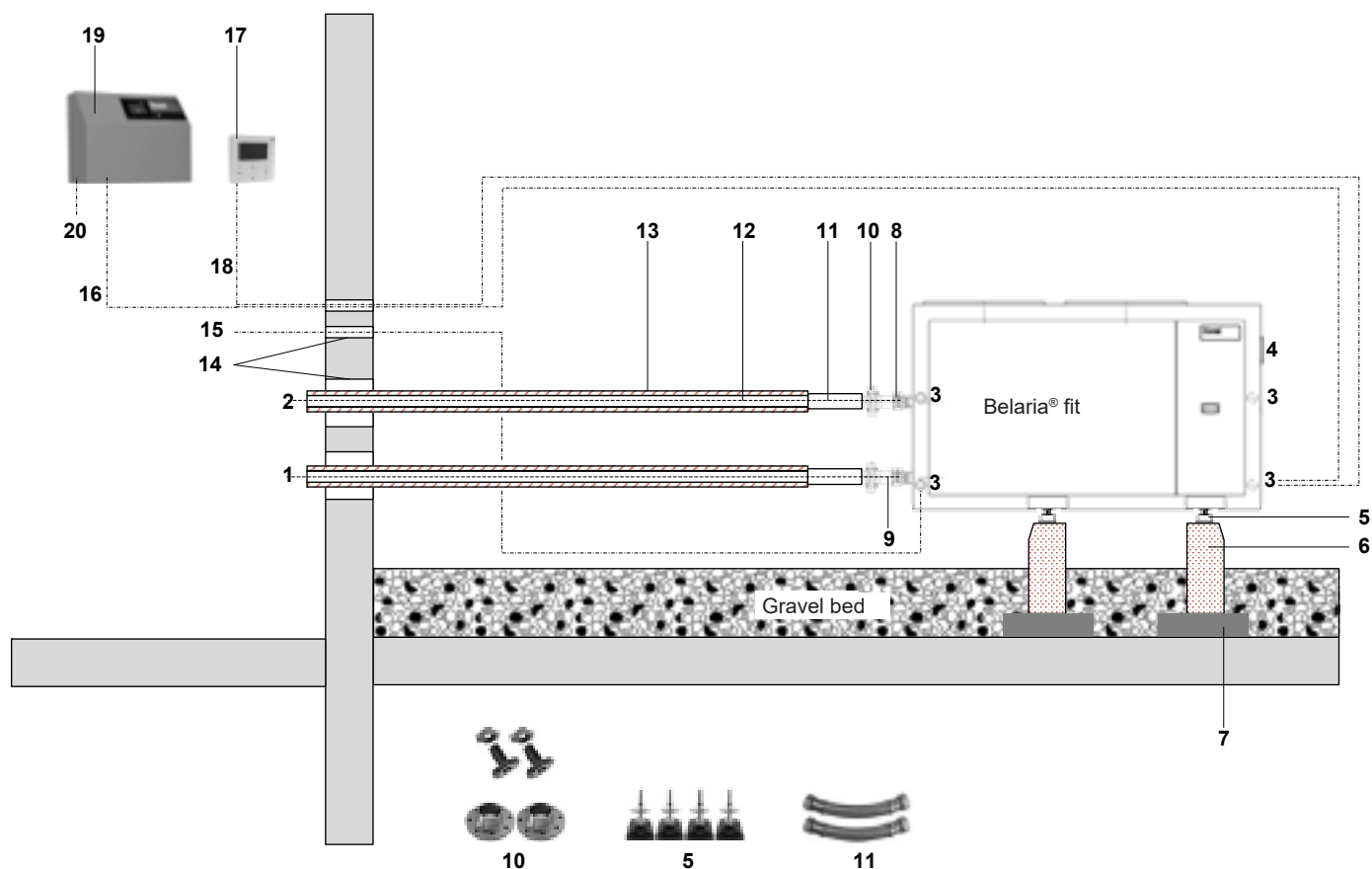
Base plan set of vibration-damping feet



The concrete base must have a level surface the size of the Belaria® fit. The base should have chamfered edges.



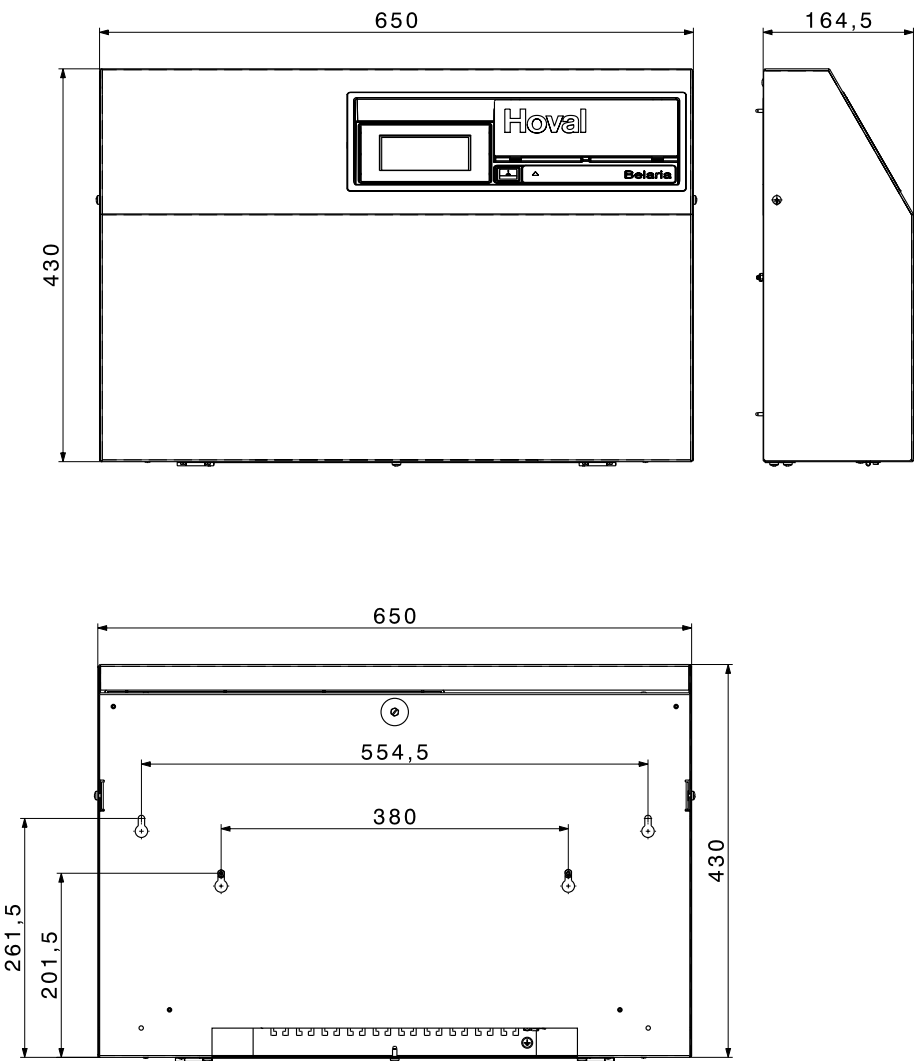
Configuration and connection diagram for the Belaria® fit



- | | | |
|----|---|--|
| 1 | Heating flow DN 50 | |
| 2 | Heating return DN 50 | |
| 3 | Electrical system feed-through | |
| 4 | Control module bracket (installation possible on site) | |
| 5 | Vibration dampers (option) | |
| 6 | Concrete base (on site) | |
| 7 | Vibration decouplers (on site) | |
| 8 | Victaulic coupling (included in the scope of delivery) | |
| 9 | Victaulic connection pipe (included in the scope of delivery) | |
| 10 | Set of welded-on flanges (option) | |
| 11 | Vibration decouplers (option) | |
| 12 | Hydraulic line (on site) | |
| 13 | Insulation (on site) | |
| 14 | Feed-throughs (on site) | |
| 15 | Main current | 400 V/5-pin (configuration of cross-section on site) |
| 16 | Connection to heat pump | |
| | Request On/Off | 230 V/2-pin (see wiring diagram) |
| | Cooling mode On/Off | 230 V/2-pin (see wiring diagram) |
| | Alarm | 230 V/2-pin (see wiring diagram) |
| 17 | Operator terminal | |
| 18 | Connection of heat pump operator terminal | |
| | (on-site | |
| | line length < 40 m: 5 x 0.75 mm ² shielded | |
| | line length < 300 m: 3 x 0.75 mm ² shielded) | |
| 19 | Electrical box | |
| 20 | Control current | 230 V/13 A/3-pin (see wiring diagram) |

The piping from the boiler room to the heat pump must be configured by the installer. Connecting pipes are not included.

Electrical box for Belaria® fit
(Dimensions in mm)



Requirements and directives

The general requirements and directives listed in the chapter Engineering apply.

Set-up

- The Belaria® fit must be mounted outdoors. The installation location must be selected in accordance with the valid requirements and directives.
- Lines carrying water must be laid insulated and frost-proof.
- The installation location must be selected as close to the building as possible. Only short and simple routing of lines guarantees cost effectiveness and low heat losses.
- The installation location must be chosen in such a way that no noise pollution can occur (do not install near bedrooms, keep a distance from neighbours).
- There must be no building openings (windows, doors, shafts, ventilation openings or the like) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Make sure that the installation location is well ventilated.
- DO NOT install the unit in the following places or locations:
 - In a potentially explosive atmosphere.
 - In places where there is a risk of fire due to escaping flammable gases (e.g. thinner or petrol) or airborne carbon fibres or flammable dust particles.
 - In places where corrosive gases (example: sulphuric acid gas) are produced. Corrosion of copper pipes and solder joints can lead to leaks in the refrigerant circuit.
- Wall ducts into the building must be airtight.
- The heat pump must not be placed in or near floor recesses.
- The heat pump must not be placed closer than 1 m to the boundary of the property. Country-specific regulations must be observed.
- The air intake and air outlet sides must not be narrowed or covered.
- The lateral air supply and the air outlet to the top must be without obstruction.
- It is imperative that the minimum distances are observed (see Dimensions/Space requirement).
- The intake air must be free of impurities such as sand and aggressive substances such as ammonia, sulphur, chlorine etc.
- The heat pump must be installed on a load-bearing fixed structure.
- If the heat pump is installed at wind-prone locations, the alignment of the heat pump must be selected in such a way that the expected wind direction is at right angles to the suction direction.
- If an alternative installation in areas subject to strong winds cannot be avoided, an additional wind shield in the form of a hedge, for example, should be installed.
- The heat pump must always be installed on a solid surface in a horizontal position. This can be achieved by means of concrete bases.
- The load-bearing capability must be adequate. The unit can be mounted with 4 vibration-damping adjustable feet.

- Air/water heat pumps generate condensate during operation. It must be ensured that the condensate produced can be absorbed to a sufficient extent by a gravel bed (see configuration and connection diagram).
- When air is discharged upwards, there is an increased frost hazard. Gutters, water pipes and water containers must not be situated in the immediate vicinity.
- The condensate drain must be discharged outside the building and must not be led into or through a building.
- To prevent damage caused by animals such as rodents or insects, all cable ducts must be properly sealed.
- The hydraulic lines from the heat pump can transmit structure-borne noise. Therefore, structure-borne noise decoupling should be provided, e.g. with compensators.

Flat roof installation

Flat roof installation of the Belaria® fit is possible under the following conditions:

- Strict compliance with safety measures regarding combustible refrigerants (see safety measures to be complied with).
- All standards concerning statics, wind load and access to roofs must be complied with.
- The heat pump must be firmly bolted onto the substructure (e.g. concrete base). The heat pump must be prevented from tilting.
- Minimum distance of the heat pump to the roof edge: 1.5 m (personal protection) + 0.8 m (working area refrigeration circuit).
- Accessibility for maintenance and repair work must be ensured. For work on the heat pump, a measuring case and test equipment, refrigerant bottle, etc. must be transported to the site, amongst other things. In addition to the safety equipment (fall protection devices, anchoring devices, etc.), this must also be taken into account for skylights, stairs, railings, etc.

Electrical connections

- The electrical connection must be carried out by a qualified technician and registered with the responsible energy supply company. The relevant electrical installation company is responsible for ensuring that electrical connection is carried out in accordance with standards and that safeguard measures are put in place.
- The mains voltage at the connection terminals of the heat pump must be 400 V or 230 V +/-10%. The conductor cross-sections of the connection line must be checked by the electrical company carrying out the work.
- This fault-current circuit breaker must be of the all-current-sensitive type B ($I_{\Delta N} \geq 300 \text{ mA}$). Country-specific requirements must be complied with. If the "fault-current circuit breaker" safeguard measure is implemented by the electrical company, a separate fault-current circuit breaker is recommended for the heat pumps. The specified RCCB types apply to the heat pump regardless of externally connected components (refer to assembly instructions, data sheets).

- Circuit breakers must be provided for the main circuit. The starting currents must be taken into account in the design.
- The electrical connection and feeder lines must be copper cables.
- Please refer to the wiring diagram for electrical details.
- The wall feedthrough should slope down from the inside to the outside.
- To avoid damage, the opening should be padded on the inside or, for example, lined with a PVC pipe.
- After installation, the wall opening must be sealed with a suitable sealing compound on site in compliance with fire protection regulations!
- The distance between the high and low voltage cables should be at least 50 mm.

Routing of the hydraulic connection lines

- If the hydraulic connection lines are laid in the ground, this must be done in a protective tube.
- Wall ducts must be sealed to the outside on site.
- After the hydraulic connection lines have been laid, they must be checked for damage and reinsulated. In case of cooling, condensate can form on the pipes.
- The hydraulic connection lines must be laid decoupled from the building and must never be laid flush-mounted.
- Shut-off valves must be installed on site in accordance with the corresponding hydraulic diagram. Opening the shut-off valves is only allowed immediately before commissioning!
- The danger of frost damage must be taken into account if there are prolonged power outages.
- False flow rates as a result of incorrect dimensions of the pipework, incorrect fittings or improper pump operation can cause damage to the heat pump.

Notice

If the main flow is interrupted during the utility lock, it is mandatory for the primary circuit to be implemented with a frost protection agent mixture.

Buffer storage tank

A buffer storage tank ensures optimal operating conditions for the heat pump:

- Hydraulic decoupling of the various volumetric flows from the heat pump and heat distribution system (heating)
- Absorbs the power reserves of the heat pump and reduces the switch-on frequency (cycling)
- Allows several heating circuits to be connected

The Hoval Belaria® fit air/water heat pump requires a buffer storage tank.

The buffer storage tank should have at least the following size to cover the energy demand of defrosting:

$$V_{SP} = \text{heat output } Q_{WP} \text{ in kW} * 8 \text{ litres/kW}$$

V_{SP} Volume of the buffer storage tank [litres]
 Q_{WP} Maximum heat output in kW with A2/W35
 The buffer storage tank must be made correspondingly larger in order to bridge periods when the electricity is switched off by the energy company, in particular in the case of radiator heating systems.

Further guidelines
 see "Engineering"

Installation on heating side

- All pertinent laws, regulations and standards for heating house pipework and for heat pump systems must be complied with.
- A sludge separator must be installed in the heating flow and a filter ball valve in the heating return.
- The safety and expansion devices for closed heating systems must be provided in accordance with EN 12828.
- Dimensioning of the pipework must be done according to the required flow rates and given pressure drops.
- Ventilation must be provided at the highest points and drainage at the lowest points of the connection lines.
- To prevent energy losses, the connection lines must be insulated with suitable material.

Transport and storage

- When removing the packaging, check the heat pump for damage. If the heat pump was damaged during transport or storage, contact Hoval customer service, a service partner or a licensed specialist immediately. They must carry out a leak test with a suitable leak detector. In the event of a leak, the heat pump must be repaired.
- Store the outdoor unit in a cool place without fire hazard and without direct exposure to heat sources. The ambient temperature must not exceed 43 °C.
- The same regulations apply for storage as for installation (no recesses, ventilation pipes, ignition sources in the storage area).
- The heat pump must not be stored in closed rooms, cellars or garages.
- The heat pump is only allowed to be stored outdoors.
- During transport, ensure sufficient ventilation in the closed vehicle, also when parking and stopping.
- Storage in passageways, escape routes or in front of entrances or exits is not permitted.
- Ignition sources such as naked flames, switched-on gas appliances, electric heaters, etc. must be kept away from the unit.
- Transport and storage only in upright position. Protect from mechanical damage and from falling over or falling down (make sure the load is secure).

