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.

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

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

Air/water heat pump - modulating

Hoval Belaria® fit

Belaria® fit type	Heat output A2W35 kW	Cooling capacity A35W18 kW	Part No.
(53)	22.4-53.3	23.7-75.6	7019 107
(85)	38.1-84.8	40.2-119.0	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”

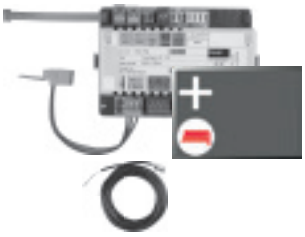
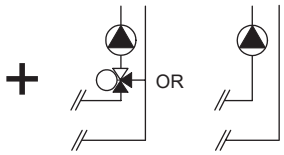
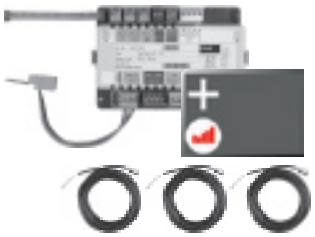
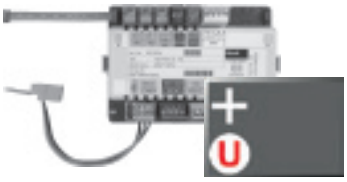
Accessories

		Part No.
	**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	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	6059 770
Belaria® fit (85)	metal springs	6059 771

TopTronic® E module expansions

for TopTronic® E basic module heat generator

	Part No.
 	6034 576
	6037 062
	6034 575

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

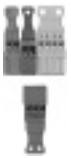
Notice
The flow rate sensor set must be ordered as well.

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

Accessories for TopTronic® E

		Part No.
	**Supplementary plug set**	
	for basic module heat generator TTE-WEZ	6034 499
	for controller modules and module expansion TTE-FE HK	6034 503
	**TopTronic® E controller modules**	
	TTE-HK/WW TopTronic® E heating circuit/ hot water module	6034 571
	TTE-SOL TopTronic® E solar module	6037 058
	TTE-PS TopTronic® E buffer module	6037 057
	TTE-MWA TopTronic® E measuring module	6034 574
	**TopTronic® E room control modules**	
	TTE-RBM TopTronic® E room control modules	
	easy white	6037 071
	comfort white	6037 069
	comfort black	6037 070
	**HovalConnect**	
	HovalConnect LAN	6049 496
	HovalConnect WLAN	6049 498
	TopTronic® E interface modules	
	GLT module 0-10 V	6034 578
	HovalConnect Modbus	6049 501
	HovalConnect KNX	6049 593
	**TopTronic® E sensors**	
	AF/2P/K Outdoor sensor	2055 889
	TF/2P/5/6T Immersion sensor, L = 5.0 m	2055 888
	ALF/2P/4/T Contact sensor, L = 4.0 m	2056 775
	TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m	2056 776
	**Bivalent switch**	
	Bivalent switch 1-piece	2056 858
	Bivalent switch 2-piece	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	Part No.
BE DN050 FM	DN 50	12.5	2062 169
BE DN065 FM	DN 65	20.0	2062 170
BE DN080 FM	DN 80	27.0	2062 171
BE DN100 FM	DN 100	47.0	2062 172

Insulations for sludge separator
BE DN 50...100 FM

Type	suitable for sludge separator	Material	Part No.
TB050	BE050 FM - BE065 FM	PUR	2050 617
TB080	BE080 FM - BE100 FM	PUR	2050 618

System water protection filter FF050-200 — 2076 376
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: (Δp < 0.1 bar): 18 m³/h
Weight: 15 kg
Water temperature max. 80 °C

Accessories

	Part No.
 **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	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 ηS [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 [3]	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

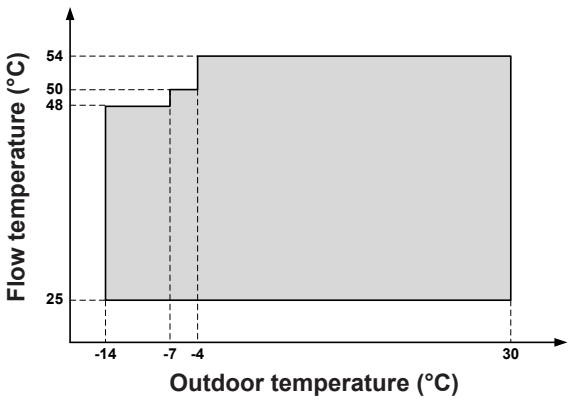
[1] 2 % can be added for class II heat pump incl. control.

[2] Reduced heat outputs according to heating performance data

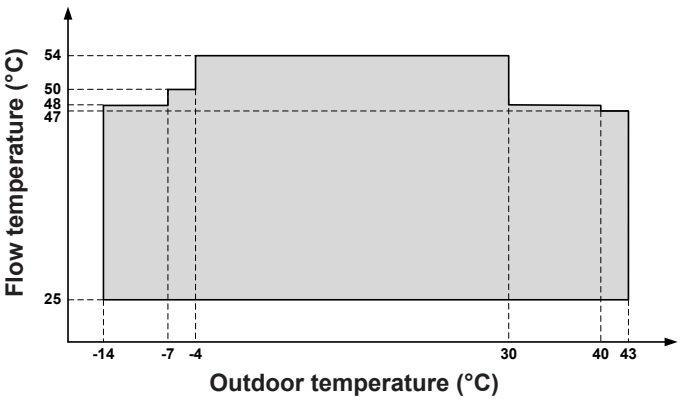
[3] Country-specific regulations must be observed. Selection of the fuse size by the electrician.

Diagrams of areas of application

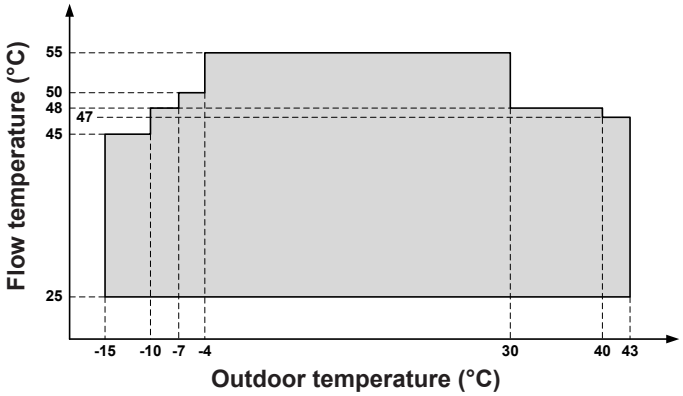
Heating Belaria® fit (53)



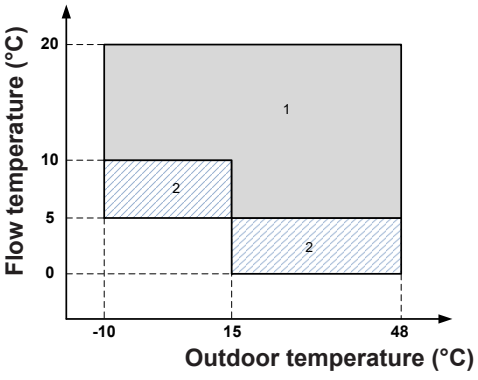
Hot water Belaria® fit (53)



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

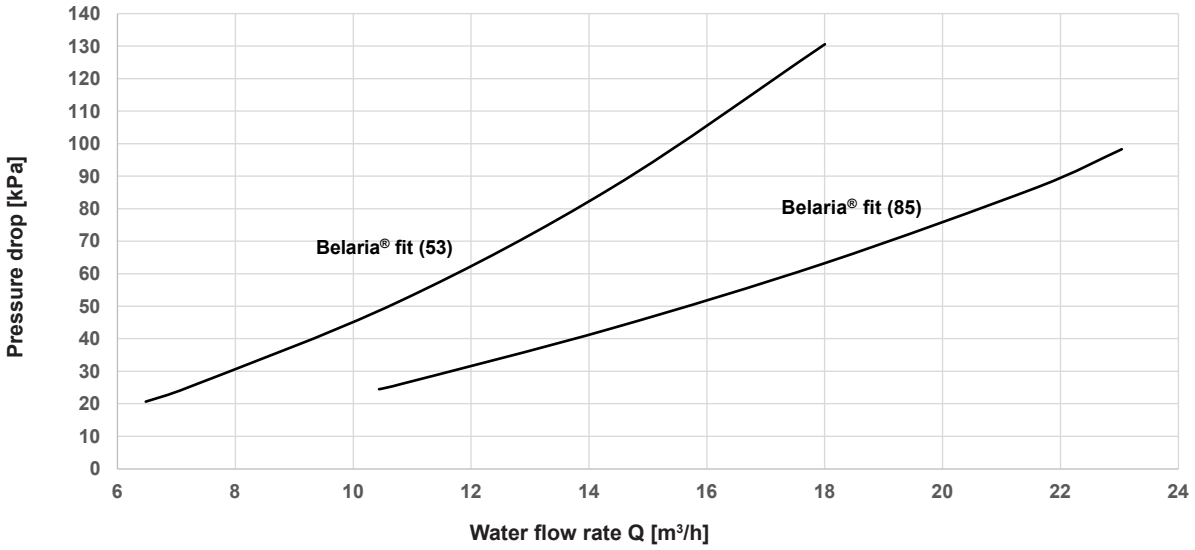
The data refers to the following conditions in cooling mode:
- Water in the internal heat exchanger = 12/7 °C
- Ambient temperature 35 °C

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

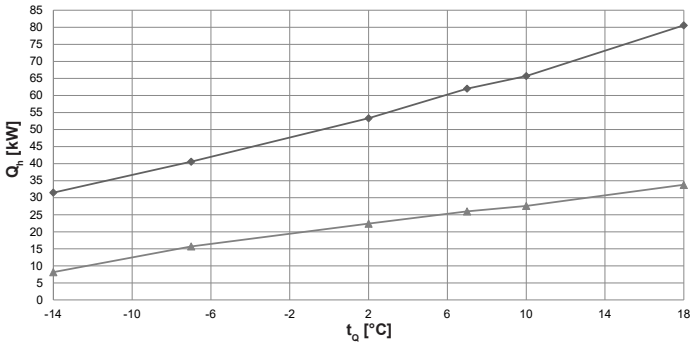
For the exact specifications of the frost protection agent used, refer to the respective manufacturer's data sheet!

Performance data – heating

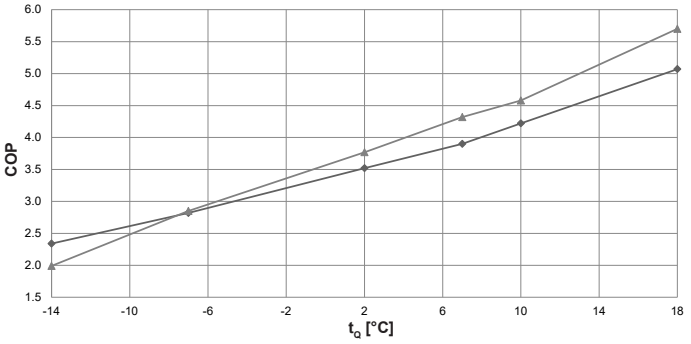
Maximum heat output allowing for defrosting losses

Belaria® fit (53)

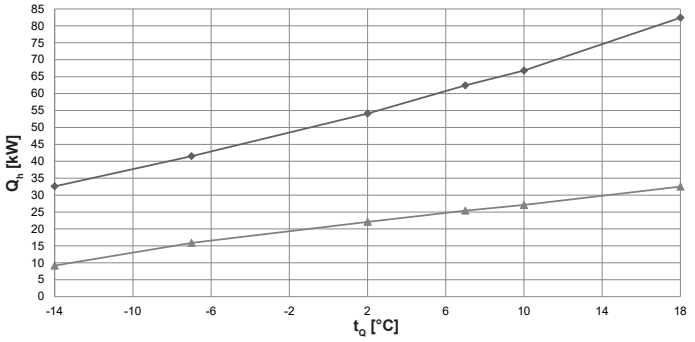
Heat output - t_{VL} 35 °C



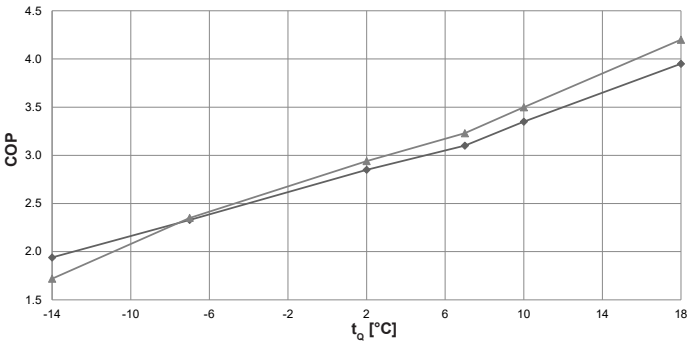
Coefficient of performance - t_{VL} 35 °C



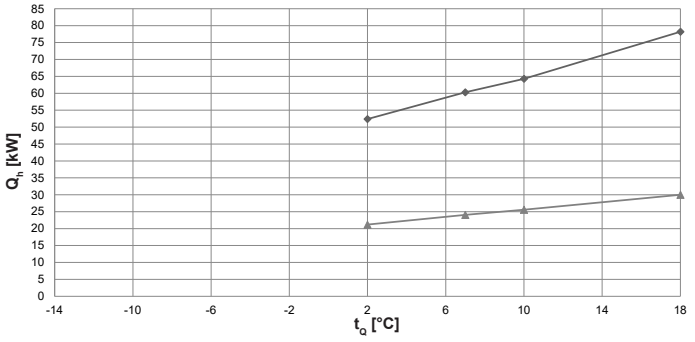
Heat output - t_{VL} 45 °C



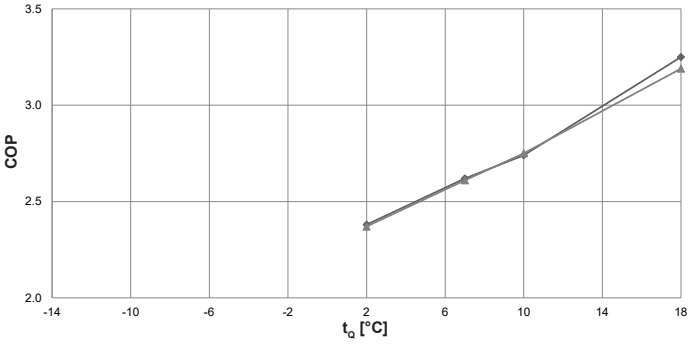
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 54 °C



Coefficient of performance - t_{VL} 54 °C



t_{VL} = heating flow temperature (°C)
t_Q = 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		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	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

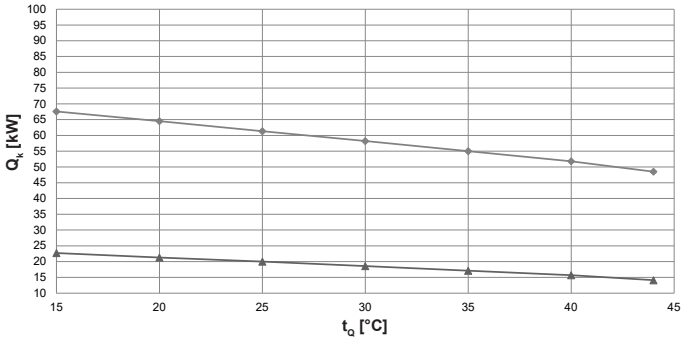
	Silent	Supersilent
Heat output factor	0.92	0.87
Power consumption factor	0.92	0.87
COP factor	1.00	1.00

Performance data - cooling

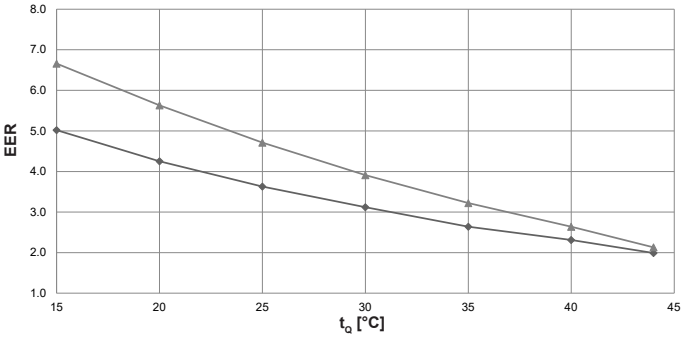
Maximum cooling capacity

Belaria® fit (53)

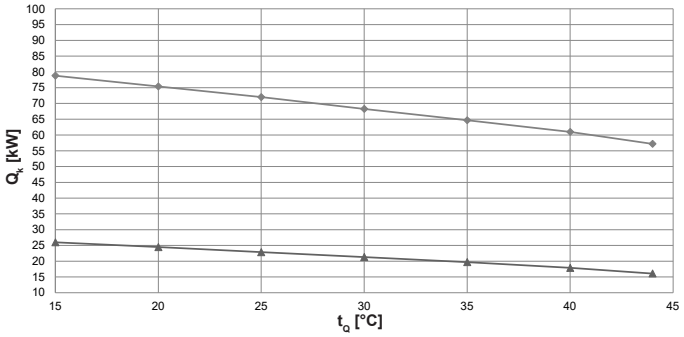
Cooling capacity - t_{VL} 7 °C



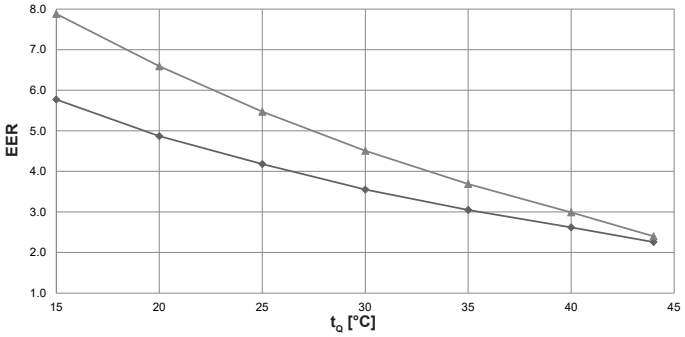
Energy efficiency ratio - t_{VL} 7 °C



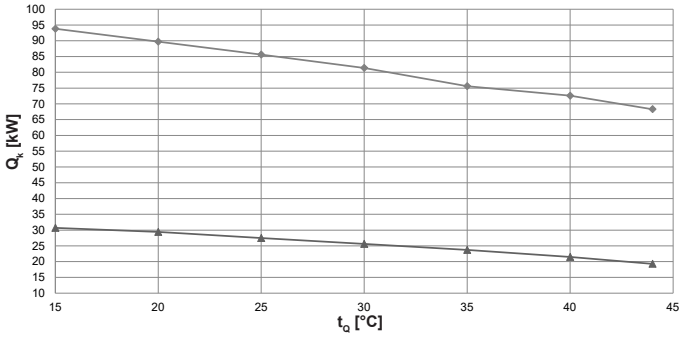
Cooling capacity - t_{VL} 12 °C



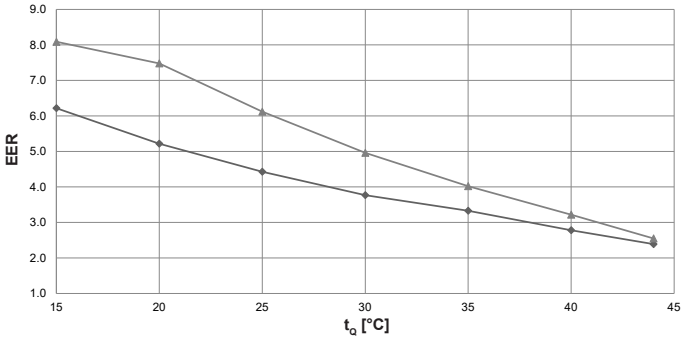
Energy efficiency ratio - t_{VL} 12 °C



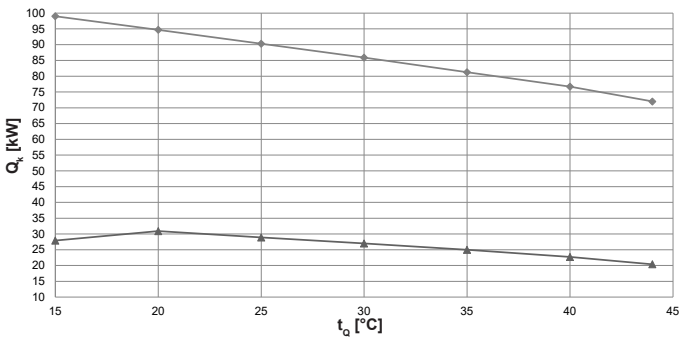
Cooling capacity - t_{VL} 18 °C



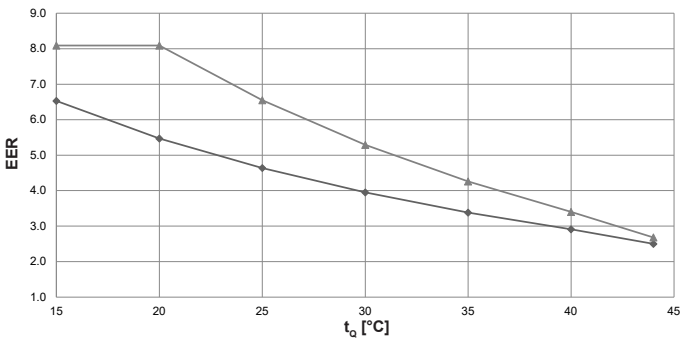
Energy efficiency ratio - t_{VL} 18 °C



Cooling capacity - t_{VL} 20 °C



Energy efficiency ratio - t_{VL} 20 °C



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
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		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	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

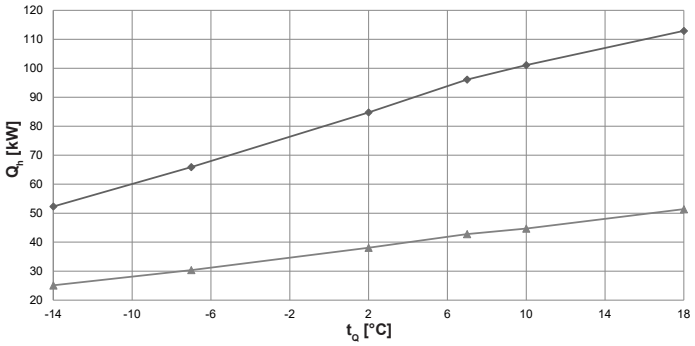
	Silent	Supersilent
Cooling capacity factor	0.90	0.85
Power consumption factor	1.00	1.00
EER factor	0.90	0.85

Performance data – heating

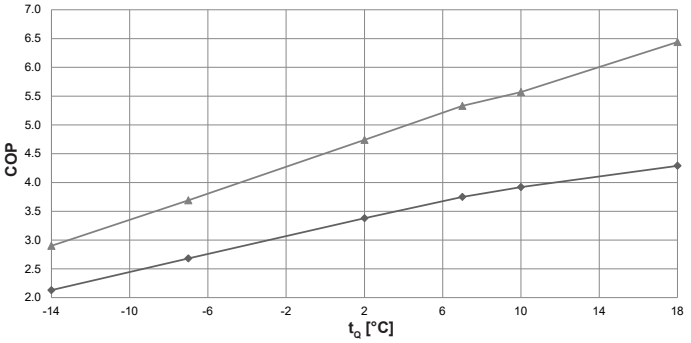
Maximum heat output allowing for defrosting losses

Belaria® fit (85)

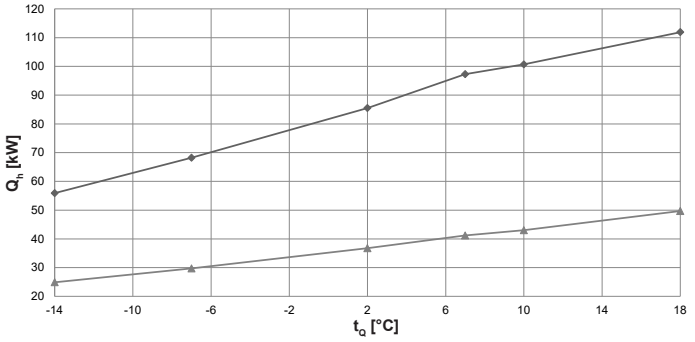
Heat output - t_{VL} 35 °C



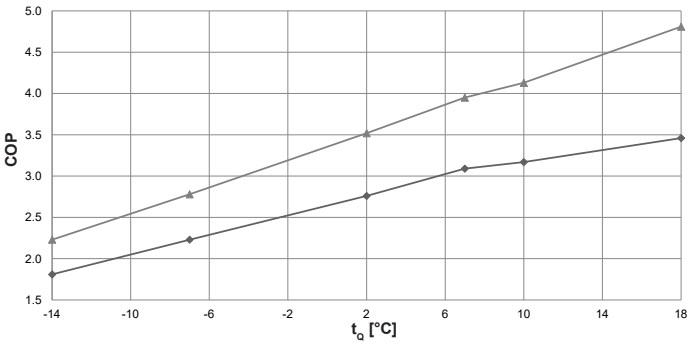
Coefficient of performance - t_{VL} 35 °C



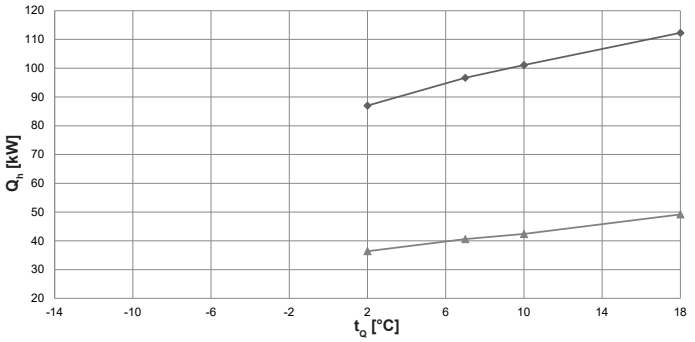
Heat output - t_{VL} 45 °C



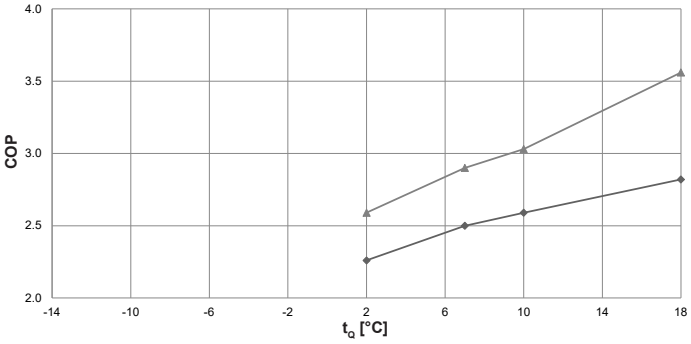
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 54 °C



Coefficient of performance - t_{VL} 54 °C



t_{VL} = heating flow temperature (°C)
t_Q = 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		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	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

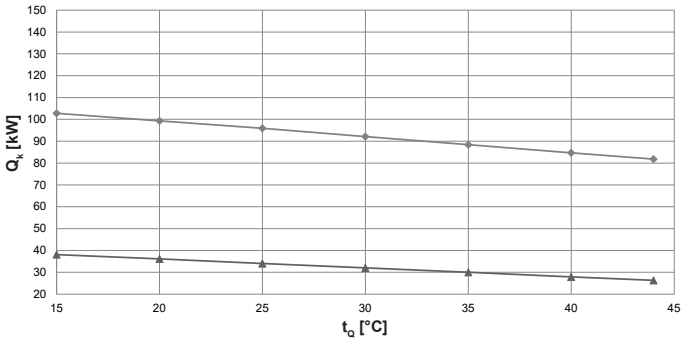
	Silent	Supersilent
Heat output factor	0.95	0.90
Power consumption factor	0.95	0.90
COP factor	1.00	1.00

Performance data - cooling

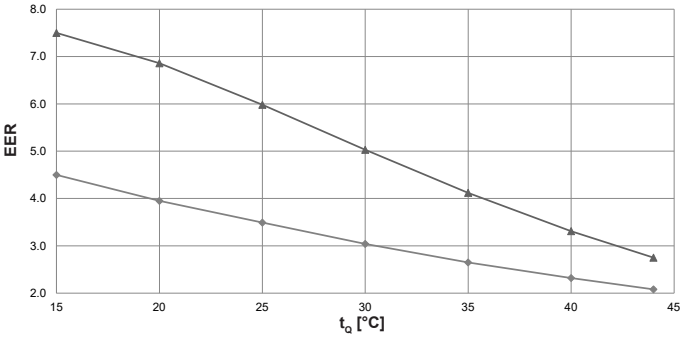
Maximum cooling capacity

Belaria® fit (85)

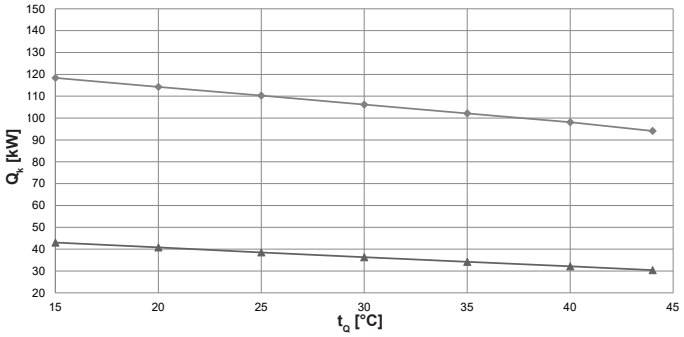
Cooling capacity - t_{VL} 7 °C



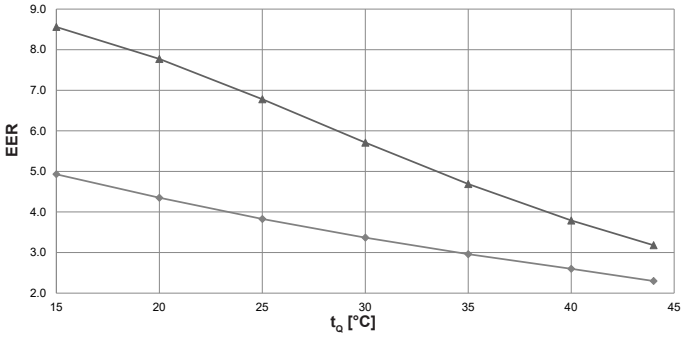
Energy efficiency ratio - t_{VL} 7 °C



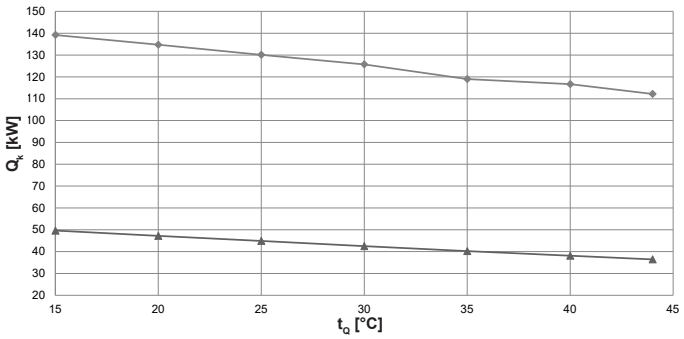
Cooling capacity - t_{VL} 12 °C



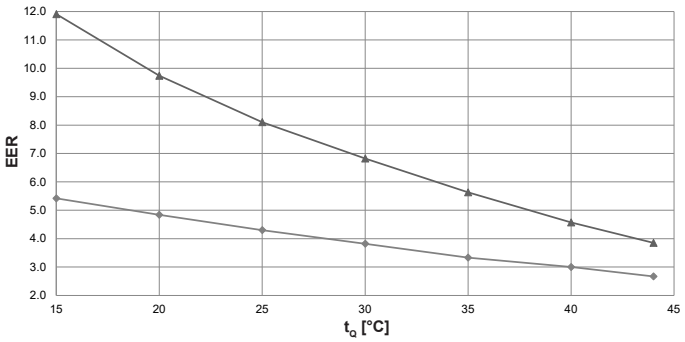
Energy efficiency ratio - t_{VL} 12 °C



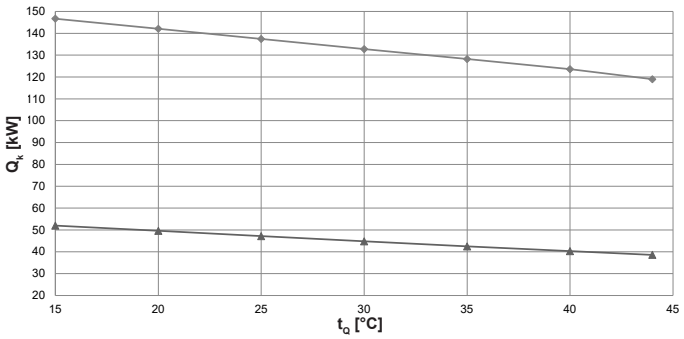
Cooling capacity - t_{VL} 18 °C



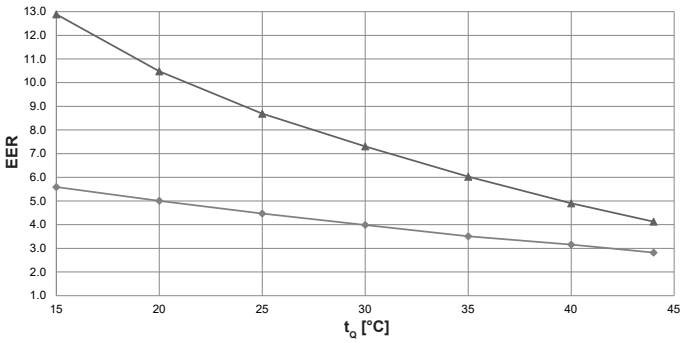
Energy efficiency ratio - t_{VL} 18 °C



Cooling capacity - t_{VL} 20 °C



Energy efficiency ratio - t_{VL} 20 °C



max. output

min. output

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
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

Performance data – cooling

Belaria® fit (85)

Data according to EN 14511

Type		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	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

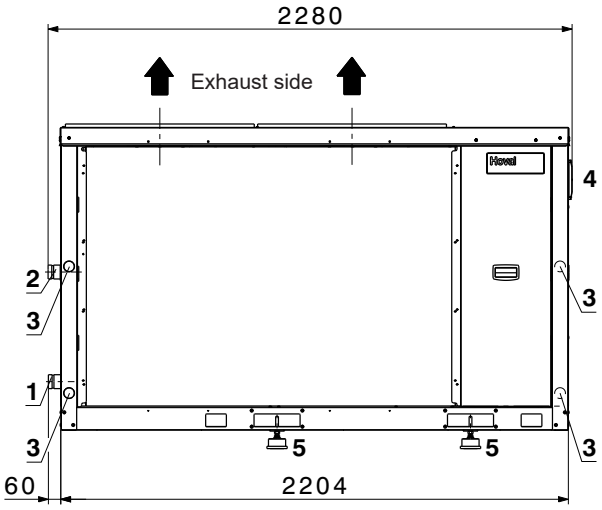
Output correction factors in silenced mode

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

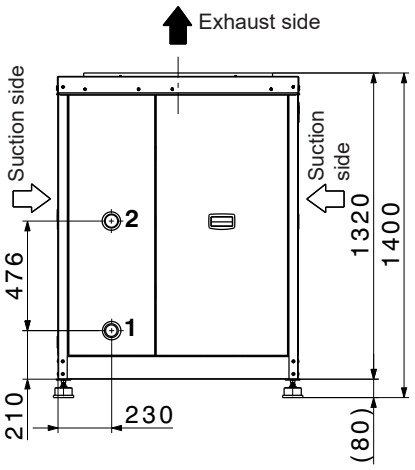
Belaria® fit (53)

(Dimensions in mm)

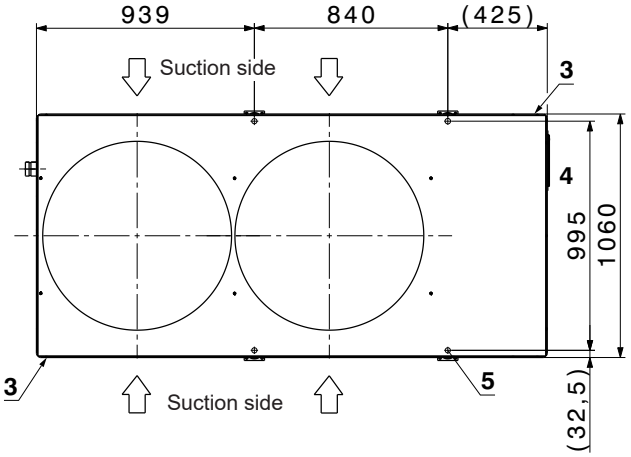
Front view (exhaust side)



Side view



Rear (suction side)

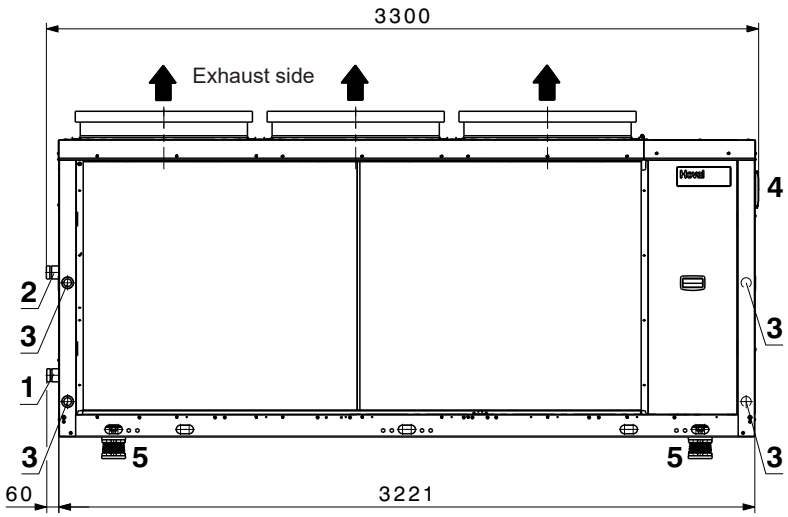


1 Flow heating DN 50
2 Return heating DN 50
3 Electrical connection
4 Control module bracket
5 Vibration dampers

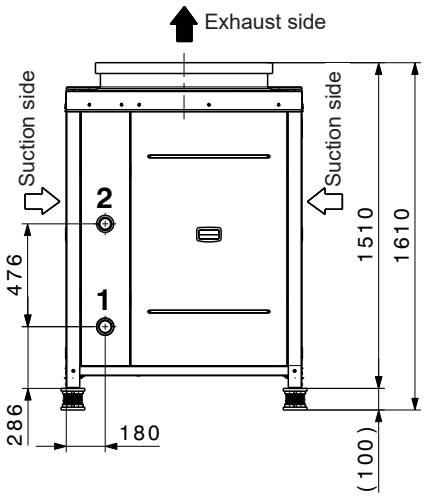
Belaria® fit (85)

(Dimensions in mm)

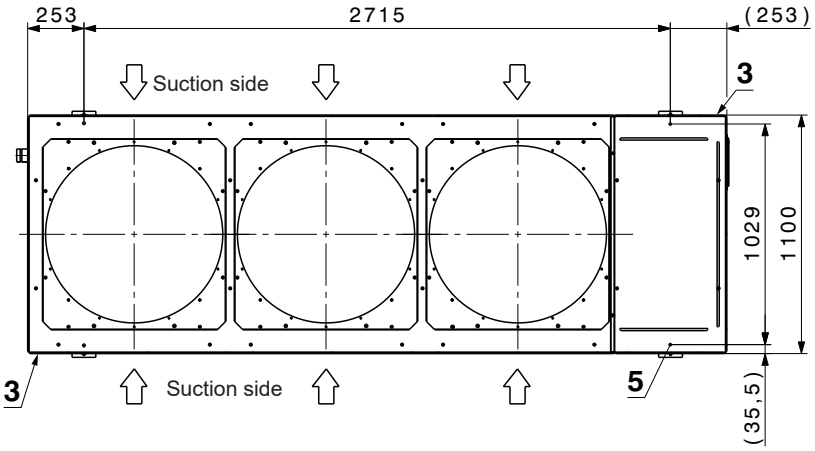
Front view (exhaust side)



Side view



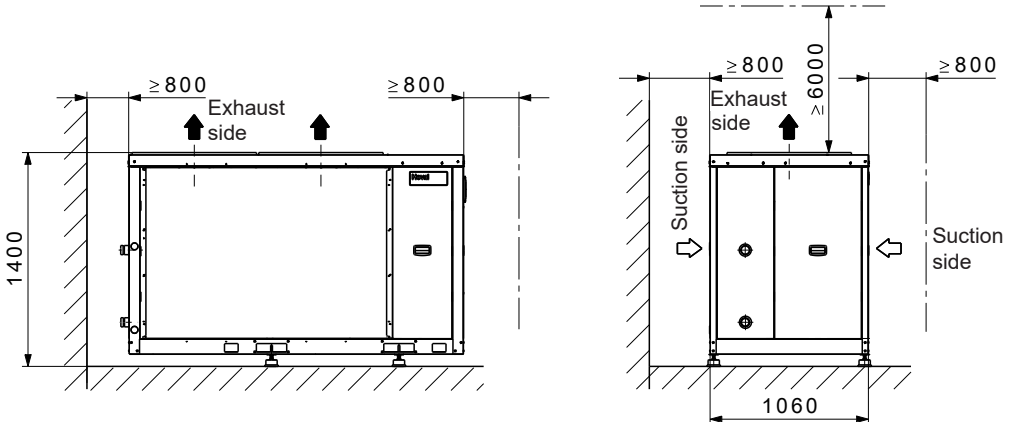
Rear (suction side)



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

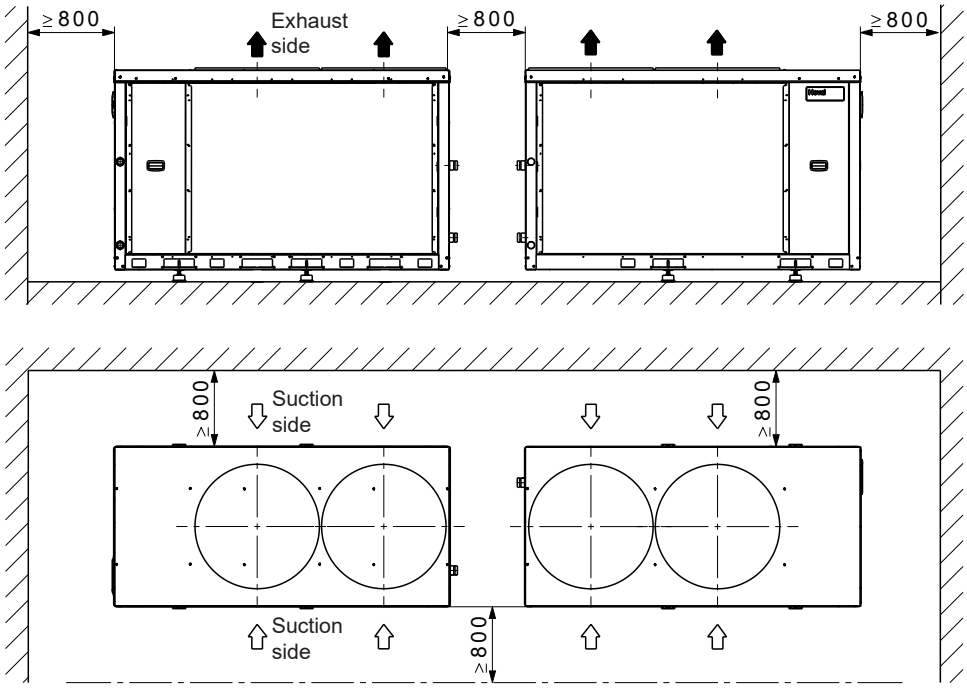
Space requirement Belaria® fit (53)

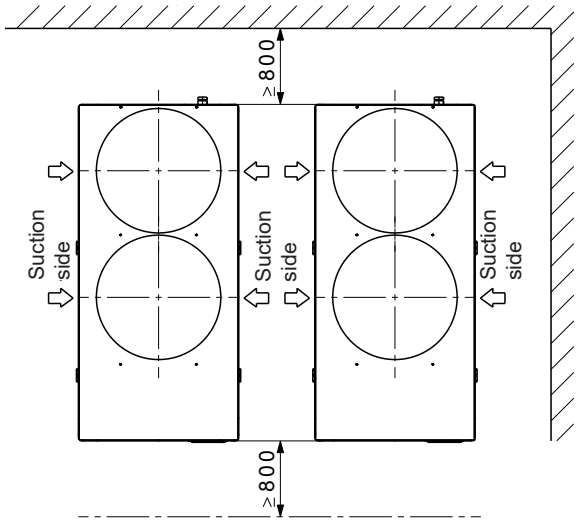
(Dimensions in mm)

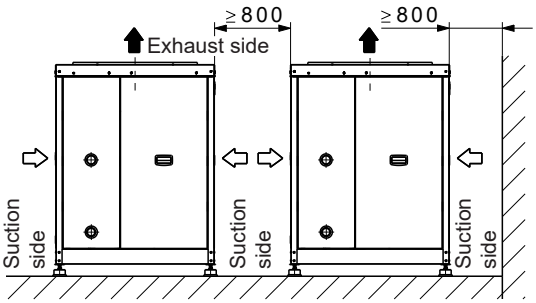


Minimum distances for cascade systems Belaria® fit (53)

(Dimensions in mm)

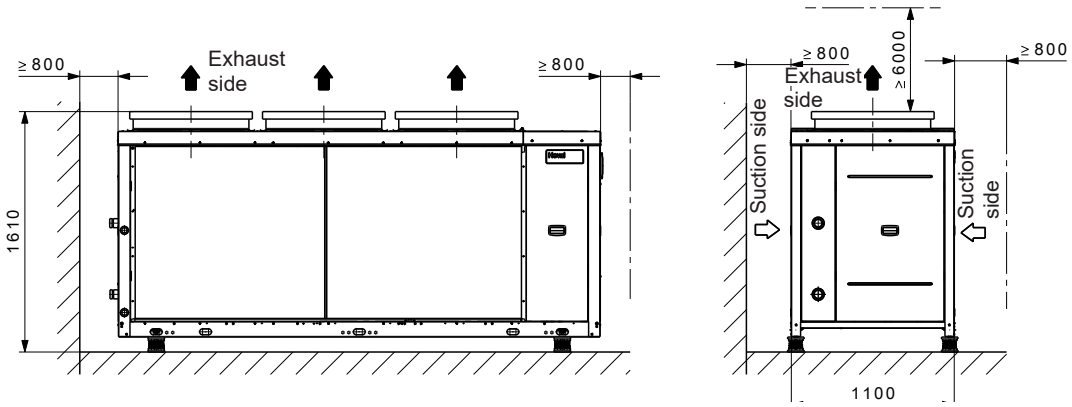






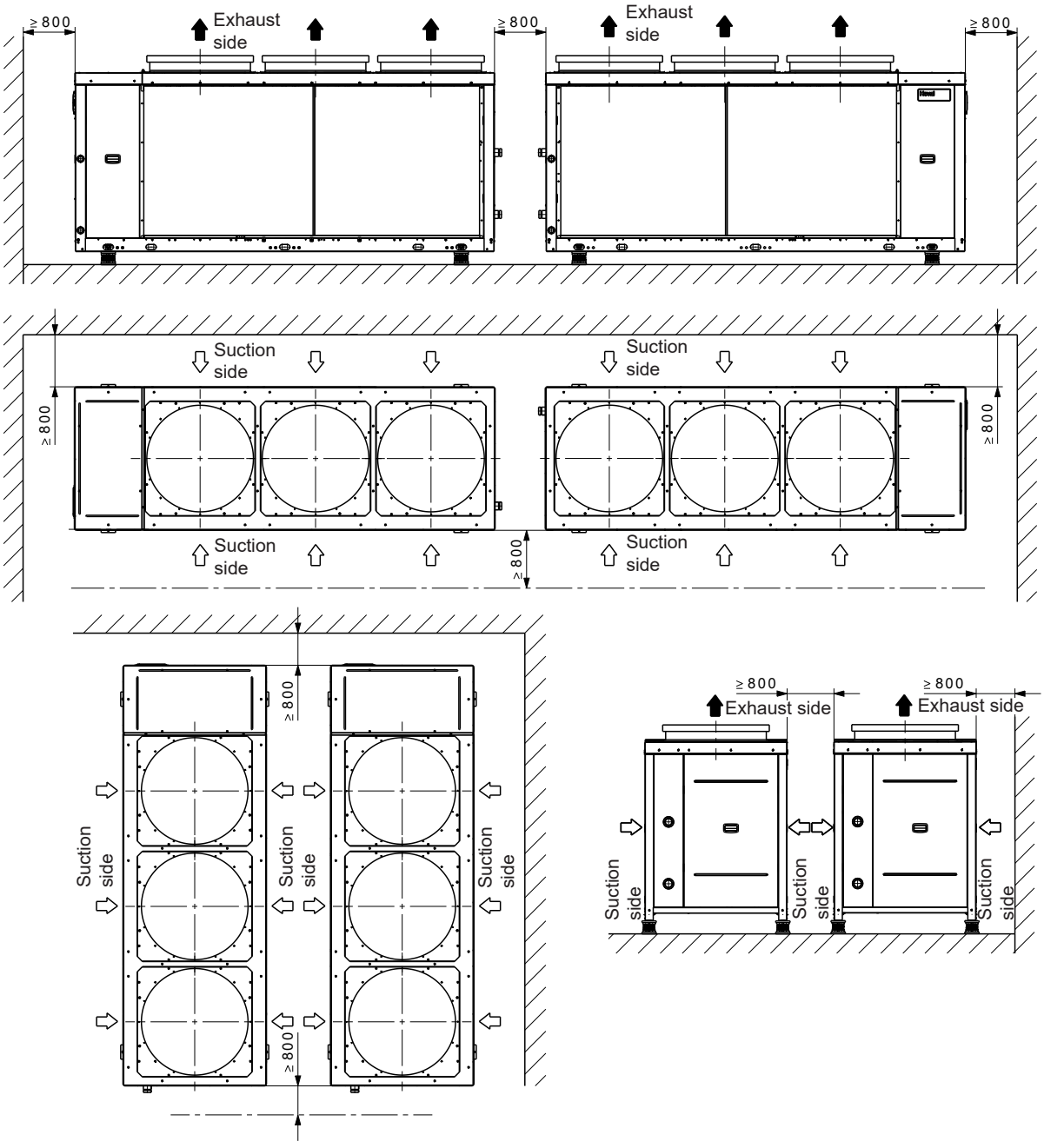
Space requirement Belaria® fit (85)

(Dimensions in mm)



Minimum distances for cascade systems Belaria® fit (85)

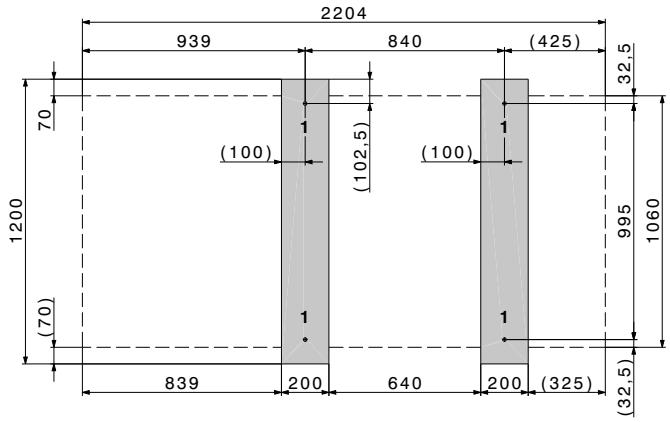
(Dimensions in mm)



Base design Belaria® fit (53)

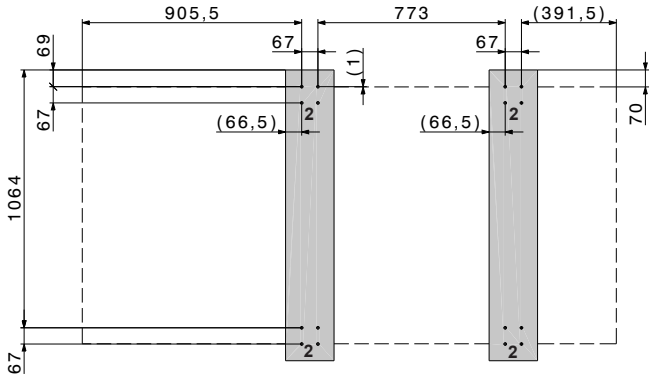
(Dimensions in mm)

Base plan feet



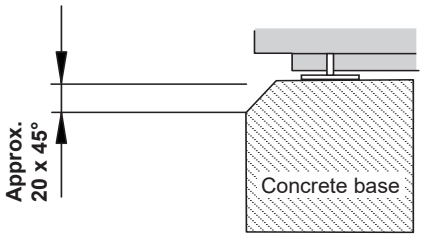
1 Hole for attachment of the heat pump M12

Base plan set of vibration-damping feet



2 Holes for vibration-damping adjustable feet

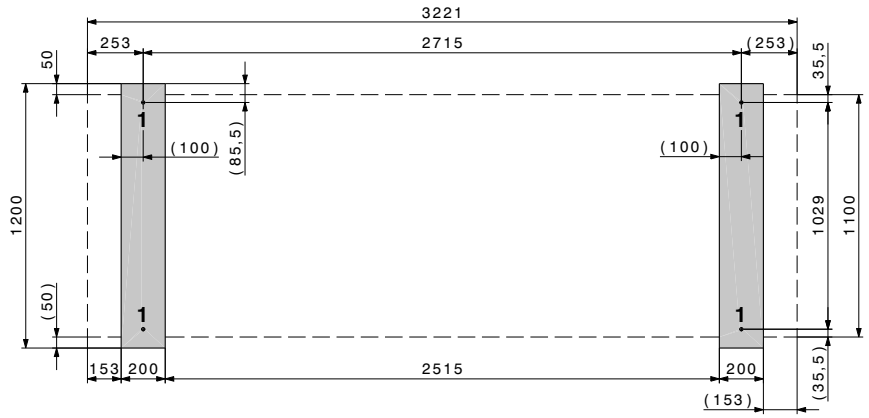
The concrete base must have a level surface the size of the Belaria® fit. The base should have chamfered edges.



Base design Belaria® fit (85)

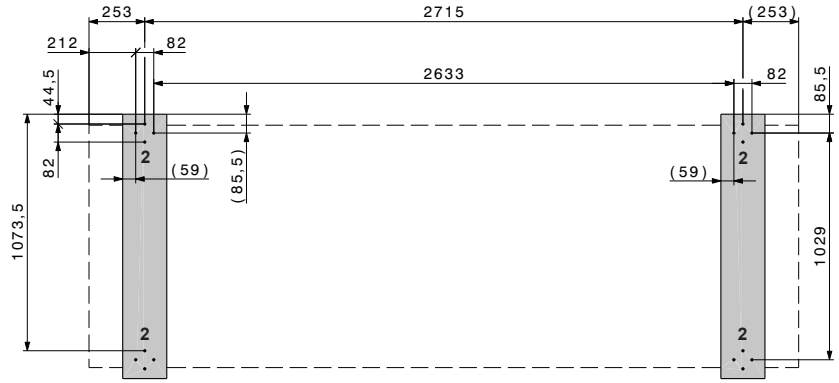
(Dimensions in mm)

Base plan feet



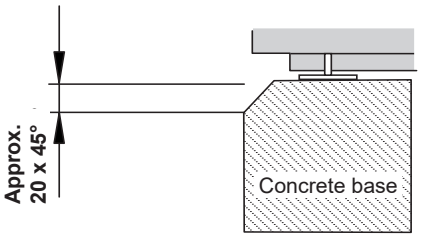
1 Hole for attachment of the heat pump M16

Base plan set of vibration-damping feet

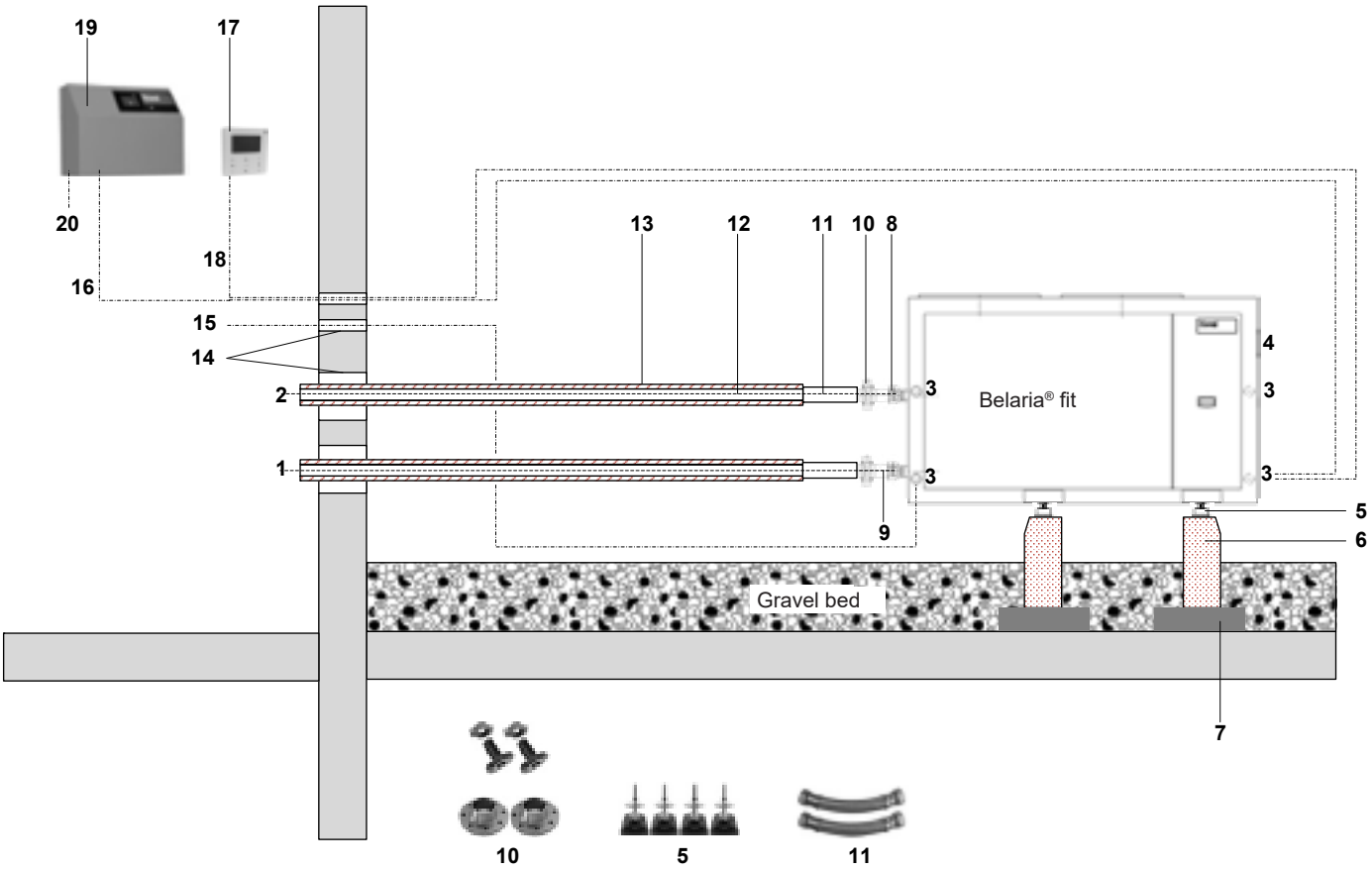


2 Holes for vibration-damping adjustable feet

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



Configuration and connection diagram for the Belaria® fit

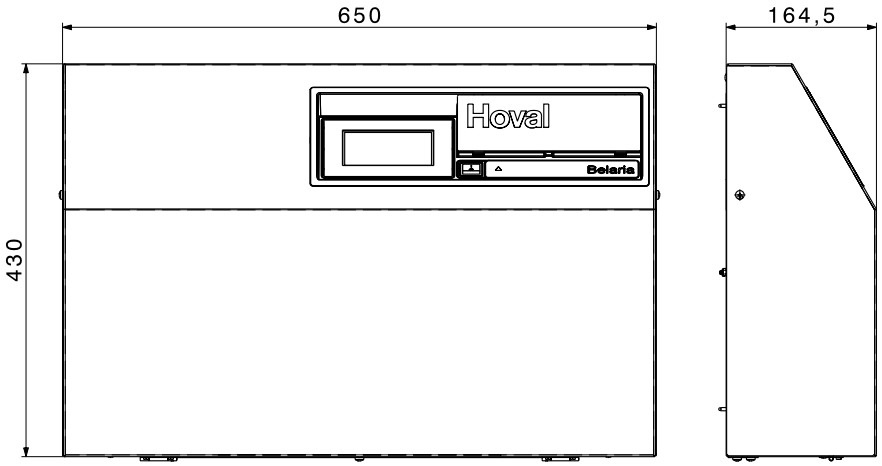


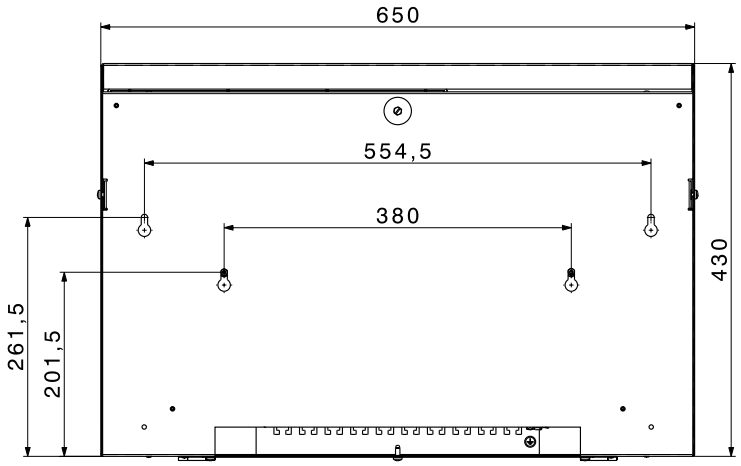
1	Heating flow DN 50	
2	Heating return DN 50	
3	Electrical system feed-through	
4	Control module bracket (installation possible on site)	
5	Vibration dampers (option)	
6	Concrete base (on site)	
7	Vibration decouplers (on site)	
8	Victaulic coupling (included in the scope of delivery)	
9	Victaulic connection 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 mm² shielded line length < 300 m: 3 x 0.75 mm² 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 (IΔN ≥ 300 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} = heat output Q_{WP} in kW * 8 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).