



Hoval

Heat pumps

Free energy from air, brine or water combined with high efficient heat pumps.

01.04.2024

Hoval Belaria® pro
Modulating monoblock heat pump for heating and cooling in the living area.

Monoblock heat pump set up outdoors consisting of outdoor unit and indoor unit.

Belaria® pro outdoor unit

- Compact floor-mounted air/water heat pump
- Elegant and extremely quiet outdoor unit
- Housing with sheet metal enclosure, powder-coated, anthracite colour (DB703)
- Belaria® pro with modulating scroll compressor
- Refrigerant R290
- Straight louvre-type evaporator
- Speed-controlled axial fan with FlowGrid (inlet grille)
- Condensate drip tray incl. tray heating and condensate trace heater for channelling all the condensate in the outdoor unit, fixed installation, 1" connection
- Plate-type condenser made of stainless steel/copper
- With cooling function with corresponding hydraulics
- Hydraulic connections behind louvre grille
 - heating connections 1½"
 - Filter ball valve in heat pump return
- Electrical connections behind louvre grille
 - 230 V control current, supplied from the indoor unit
 - 400 V main power supply
 - Data cable - bus connection to the indoor unit
- With fitting accessories for fixing the outdoor unit on the ground

Belaria® pro indoor unit

- Compact wall-mounted indoor unit
- Casing made of structured EPP, colour black
- TopTronic® E controller installed
- With WFA-200S automatic heat pump device
- Integrated components:
 - Speed-regulated high-efficiency pump
 - Flow sensor/heat meter
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- Diaphragm pressure expansion tanks see "Various system components"
- Hydraulic connections at bottom
 - heating connections 1¼" - reductions 1½"-1¼" supplied
- Electrical connections introduced from bottom
- With fitting accessories for fixing the indoor unit to the wall
- Shut-off ball valves are included in the scope of delivery

TopTronic® E controller

Control panel

- 4.3-inch colour touchscreen
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp
- Mains isolator



Model range

Belaria® pro type	Heat output ¹⁾		Cooling capacity ¹⁾	
	35 °C	55 °C	A-7W35 kW	A2W35 kW
(24)			10.5-22.1	10.1-24.0

Energy efficiency class of the compound system with control.

¹⁾ Modulation range

TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating states
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

TopTronic® E basic module heat generator TTE-WEZ

- 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
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- RAST 5 basic plug set

Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
 - Module expansion heating circuit or
 - Module expansion Universal or
 - Module expansion heat balancing
- Can be networked with up to 16 controller modules in total:
 - Heating circuit/DHW module
 - Solar module
 - Buffer module
 - Measuring module

Number of additional modules that can be installed in the heat generator:

- 1 module expansion and 1 controller module **or**
- 2 controller modules

The supplementary plug set must be ordered in order to use expanded controller functions.

For further information about the TopTronic® E, see "Controls"

EnergyManager PV smart

Feature to increase self-generated power consumption in use with HovalConnect.

If a HovalConnect gateway is used together with the heat pump, the EnergyManager PV smart feature is available. This allows the heat pump to be operated preferentially at times of higher solar radiation. The feature uses online weather data on the current solar radiation for this purpose and can be adjusted by means of an associated threshold value. The self-consumption of electricity from an existing photovoltaic plant is thus increased and the purchase of grid electricity is reduced. This results in a lasting and significant cost-saving potential without further investment costs for the customer.

Delivery

- Indoor and outdoor unit delivered packaged separately
- Sensor set Belaria® pro:
Outdoor, flow and calorifier sensor included separately in the electrical box

On site

- Wall ducts for hydraulic connection lines
- Hydraulic connection lines outdoor/indoor unit
- Electrical connection line outdoor/indoor unit

Air/water heat pump



Hoval Belaria® pro (24)

Belaria® pro Type	Heat output ¹⁾		Cooling capacity ¹⁾
	A-7W35 kW	A2W35 kW	A35W18 kW
(24)	10.5-22.1	10.1-24.0	10.2-24.4

¹⁾ Modulation range

Part No.

7018 674

EnergyManager PV smart

Free feature to increase self-generated power consumption in use with HovalConnect.

Further information

see "Description"

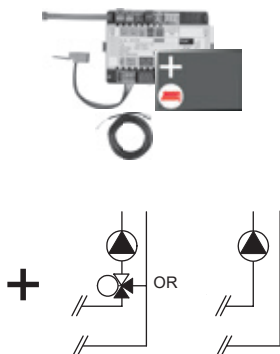
Electric heating elements

see "Calorifiers" - chapter "Electric heating elements"

Energy efficiency class

see "Description"

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
- 1 heating/cooling circuit with mixer

Consisting of:

- Fitting accessories

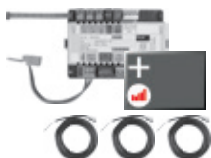
- 1 contact sensor

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

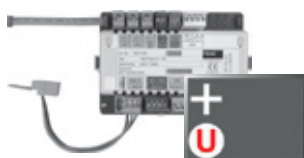
Consisting of:

- Fitting accessories

- 3 contact sensors

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

- Plug set FE module



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

Further information

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

Notice

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

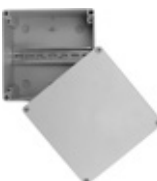
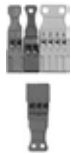
Part No.

6034 576

6037 062

6034 575

Accessories for TopTronic® E



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

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 room control modules

TTE-RBM	TopTronic® E room control modules	
	easy white	6037 071
	comfort white	6037 069
	comfort black	6037 070

Enhanced language package TopTronic® E

one SD card required per control module Consisting of the following languages: HU, CS, SL, RO, PL, TR, ES, HR, SR, JA, DA	6039 253
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HovalConnect

HovalConnect LAN	6049 496
HovalConnect WLAN	6049 498
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E interface modules

GLT module 0-10 V	6034 578
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TopTronic® E sensors

AF/2P/K	Outdoor sensor H x W x D = 80 x 50 x 28 mm	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

for various release or switching functions	
Bivalent switch 1-piece	2056 858
Bivalent switch 2-piece	2061 826

System housing

System housing 182 mm	6038 551
System housing 254 mm	6038 552

TopTronic® E wall casing

WG-190	Wall casing small	6052 983
WG-360	Wall casing medium	6052 984
WG-360 BM	Wall casing medium with control module cut-out	6052 985
WG-510	Wall casing large	6052 986
WG-510 BM	Wall casing large with control module cut-out	6052 987

Further information
see "Controls"

Accessories



HP line insul. AF-WPP 160-50

for Belaria® pro (24)
 Flexible, pre-insulated and self-compensating line with two heating pipes and two empty pipes
 Outside diameter: 160 mm
 Fluid pipes: 2 x 50 mm/4.6 mm
 Empty pipe 1: 32 mm
 Empty pipe 2: 25 mm
 Bending radius: 0.5 m
 Operating temperature: -40 °C to +90 °C
 Maximum temperature: +95 °C

Dimension inside/outside	Line length m
DN 40/50	10
DN 40/50	15
DN 40/50	20
DN 40/50	25

Part No.



Connector set HP line VS 50-WPP

For HP line insulated AF-WPP 160-50
 Consisting of:
 - 2 shrink-fit end caps
 - 4 clamping adapters 1½" external thread, PN 6
 - 1 building feed-in pressing water
 Core hole diameter: 198-202 mm
 - 1 fixed point clamp



Lining pipe DN 200 D210/200 x 400

For HP line insulated AF-WPP
 Lining pipe for feeding the HP lines through ceilings, walls and floors.
 Suitable for walling in and cementing in.
 Lining pipe material: PVC
 Formwork cover material: PE
 Outer Ø: 210 mm
 Internal Ø: 200 mm
 Length: 400 mm



Connection set AS40-BPA

For Belaria® pro (24)
 Flexible connection line that can be shortened for connecting flow and return within the heat pump
 Consisting of:
 - 1 3.0 m corrugated pipe DN 32 insulated
 Insulation 19/42 with PE protective foil
 - 2 angle screw connections IT/ET 1½"
 - 4 union nuts 1½"
 - 3 support rings 1½"
 1 extra support ring for compression
 - 6 flat seals NBR

Notice

In cooling applications, the piping and fittings must be insulated accordingly.



Adhesive tape IKB

for thermal insulation made of EPDM
 Thickness: 3 mm
 Width: 50 mm
 Roll: 15 m

2080 580
 2080 581
 2080 582
 2080 583

6058 641

2080 584

6058 642

2023 563



Vibration decoupler
 for reducing structure-borne noise
 from heat pumps indoors,
 cannot be shortened
 Consisting of:
 - 1 vibration decoupler
 insulated for heating side
 flat-sealing with union nut
 - 2 flat seals
 Nominal pressure: PN 10

Dimension	Connection inches	Nominal length mm
DN 25	1"	300
DN 25	1"	500
DN 25	1"	1000
DN 32	1¼"	300
DN 32	1¼"	500
DN 32	1¼"	1000
DN 40	1½"	500
DN 40	1½"	1000
DN 50	2"	500
DN 50	2"	1000

Part No.

2082 222
 2082 223
 2080 794
 2082 224
 2082 225
 2080 796
 2082 226
 2080 798
 2082 227
 2080 800



Separation system TS40-36-WP-SG
 for Belaria® pro (24)
 for separation of heating circuit and
 primary heating circuit.
 Consisting of:
 - Plate heat exchanger with 36 plates
 (soldered)
 - Wall installation connection bracket
 - Filling/flushing unit
 - Connection screw fittings
 - Safety group DN 15-1" insulated

6058 808



**System water protection filter
 FGM025-200**
 For horizontal installation in return
 For filtration of heating and cooling water
 Consisting of:
 - Filter head and bowl in brass
 - Magnetic insert (nickel-neodymium)
 - 2 pressure gauges
 - filter surface in stainless steel
 - Filter fineness 200 µm
 - With drain valve
 - Connections Rp 1" internal thread
 with integrated shut-off valves and
 union connection (outlet)
 Max. flow rate ($\Delta p < 0.1$ bar): 5.5 m³/h
 Weight: 6.8 kg
 Water temperature: max. 90 °C
 - incl. steam diffusion-tight insulating shells

6058 256

Part No.



Differential pressure relief valve DN 32

for installation in a HA group DN 32
 both ends 1¼" external thread
 Self-sealing with O-ring
 and screw connections
 Operating pressure: max. 10 bar
 Operating temperature: max. 110 °C
 Setting range: 0.1-0.6 bar
 Connections: 1¼" internal thread/
 1¼" external thread
 Centre distance: 125 mm
 Casing and spring hood made of brass
 Spring made of stainless steel
 Seals made of EPDM
 Setting handle made of plastic with
 hexagon socket fastening screw

6014 849



Safety set SG15-1"

Suitable up to max. 50 kW
 complete with safety valve (3 bar)
 Pressure gauge and autom.
 aspirator with shut-off valve.
 Connection: DN 15, 1" internal thread

641 184



Switching ball valve VBI60...L

DN 25-50, PN 16, 120 °C

- Three-way ball valve made of brass
 with threaded connection
- Leakage rate: 0 ... 0.0001 % of kvs value
- Permitted media: cold water, cooling water,
 DHW, hot water, water with frost protection
- Recommendation: water treatment
 according to VDI 2035
- Media temperature: -10 ... 120 °C

DN	Connection inches	kvs m³/h
25	Rp 1"	9
32	Rp 1¼"	13
40	Rp 1½"	25
50	Rp 2"	37

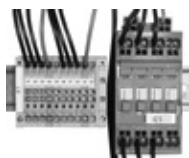
6052 444
 6052 445
 6052 446
 6052 447



Motor drive GLB341.9E

For straight-way ball valves VAG60.. and
 switching ball valves VBI60.. DN 15-50
 Operating voltage: 230 V, 50/60 Hz
 Control signal 2-point/3-point
 Single-wire/2 wire control
 Operating time: 150 s
 Nominal torque: 10 Nm
 Permitted ambient temperature:
 -32 °C to +55 °C

2070 331



Control set (switching contactor)

For Belaria® pro (24)
 Necessary for activating an
 external electric heating element.
 Control kit for installation in the
 wall-mounted indoor unit.

6058 668



Dew point switch FAS

mechanical dew point switch
 for monitoring the formation of
 condensate using adjustable
 switching value

2070 911

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.

Part No.

Belaria® pro (24)

Type	pro (24)	
• Energy efficiency class of the compound system with control ¹⁾	35 °C/55 °C	A+++/A+++
• Room heating energy efficiency "moderate climate" 35 °C η _S	%	225
• Room heating energy efficiency "moderate climate" 55 °C η _S	%	165
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.7/4.2
• Seasonal coefficient of performance heating A35W18 ²⁾	SEER	5.6
• Seasonal coefficient of performance heating A35W7 ²⁾	SEER	3.2
Max./min. performance data heating and cooling in acc. with EN 14511		
• Max. heat output A2W35	kW	24.0
• Max. heat output A-7W35	kW	22.1
• Min. heat output A15W35	kW	10.0
• Max. cooling capacity A35W18	kW	22.2
• Max. cooling capacity A35W7	kW	10.2
• Min. cooling capacity A35W18	kW	0.0
Nominal output data heating in acc. with EN 14511		
• Nominal heat output A2W35	kW	14.5
• Coefficient of performance A2W35	COP	4.9
• Nominal heat output A7W35	kW	16.7
• Coefficient of performance A7W35	COP	5.7
• Nominal heat output A-7W35	kW	14.8
• Coefficient of performance A-7W35	COP	3.6
Nominal output data cooling in acc. with EN 14511		
• Nominal cooling capacity A35W18	kW	18.6
• Energy efficiency ratio A35W18	EER	4.5
• Nominal cooling capacity A35W7	kW	13.8
• Energy efficiency ratio A35W7	EER	3.4
Sound data		
• Max. sound power level outdoor unit, night operation	dB(A)	52
• Sound power level EN 12102 outdoor unit ^{3), 4)}	dB(A)	58
• Max. sound power level outdoor unit	dB(A)	62
• Sound pressure level 5 m ^{3), 5)}	dB(A)	39
• Sound pressure level 10 m ^{3), 5)}	dB(A)	33
Hydraulic data		
• Max. flow temperature	°C	70
• Max. flow rate heating side with A7W35, ΔT 6 K	m ³ /h	3.9
• Nominal flow rate heating side with A7W35, ΔT 5 K	m ³ /h	2.9
• Pressure drop heating side at nominal flow	kPa	10
• Residual overpressure of heating pump at max. pump speed and nominal flow	kPa	60
• Residual overpressure of heating pump at max. flow rate	kPa	35
• Max. operating pressure on the heating side	bar	3
• Flow/return connection heating	R	1½"
• Nominal air volume outdoor unit (A7W35 and nominal rotation speed)	m ³ /h	6600
• Hydraulic connection line, max. length/dimension inside	m/DN	30/DN 40
Cooling technical data		
• Refrigerant		R290
• Compressor		modulating
• Refrigerant filling quantity	kg	4.4
• Compressor oil filling quantity	l	0.9
• Compressor oil type		PZ46M

Type	pro (24)	
Electrical data		
• Electrical connection compressor	V/Hz	3~400/50
• Control electrical connection	V/Hz	1~230/50
• Max. heat pump operating current	A	19.5
• Max. compressor operating current	A	19.2
• Max. fan operating current	A	0.28
• Max. fan power consumption	W	194
• Max. starting current heat pump	A	19.2
• Output factor		0.88
• External protection main current	A	C/K 20
• External protection control current	A	B/Z 13
Dimensions/weight of outdoor unit		
• Dimensions (H x W x D)	mm	1461 x 1928 x 997
• Weight	kg	450
• Protection class		IP24
Dimensions/weight of indoor unit Belaria® pro		
• Dimensions (H x W x D)	mm	1005 x 550 x 280
• Weight	kg	28
• Protection class		IP20

¹⁾ Related to moderate climate

²⁾ EN 14825

³⁾ The sound values apply with a clean evaporator. These values are temporarily exceeded before defrosting.

⁴⁾ The sound power level EN 12102 outdoor unit is 56 dB(A) at 30 % compressor speed.

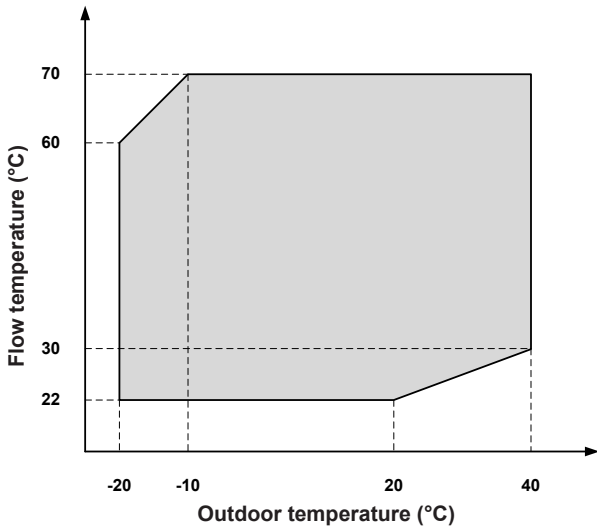
⁵⁾ The sound pressure levels indicated apply if the outdoor unit is placed at a building façade. These values are reduced by 3 dB if the outdoor unit is free-standing. With installation in a corner, the sound pressure level increases by 3 dB.


Using a fault-current circuit breaker RCCB type B, I Δ n \geq 300 mA is recommended. Country-specific regulations must be observed.

Diagrams of areas of application

Heating and domestic hot water

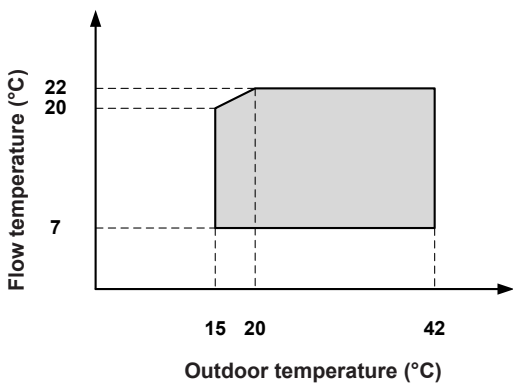
Belaria® pro (24)




 Area of application of the heat pump for heating/domestic hot water

Cooling

Belaria® pro (24)



 Area of application of the heat pump for cooling

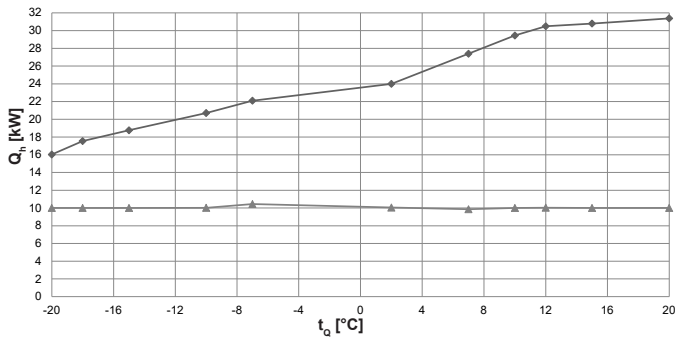
Performance data – heating

Maximum heat output allowing for defrosting losses

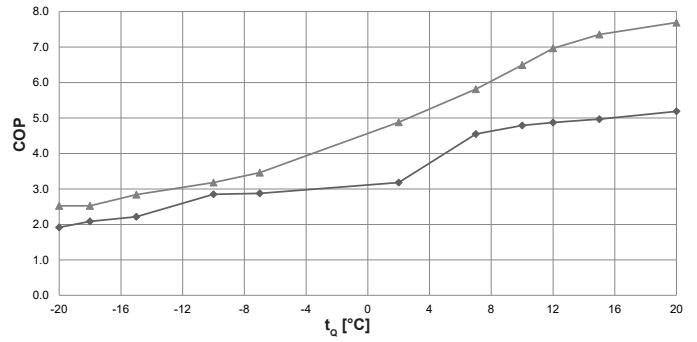
Belaria® pro (24)

Data according to EN 14511

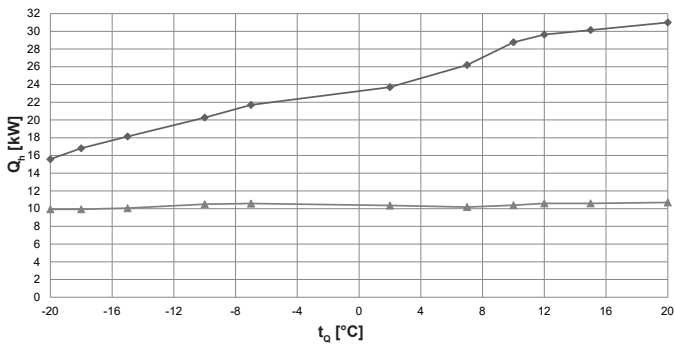
Heat output - t_{VL} 35 °C



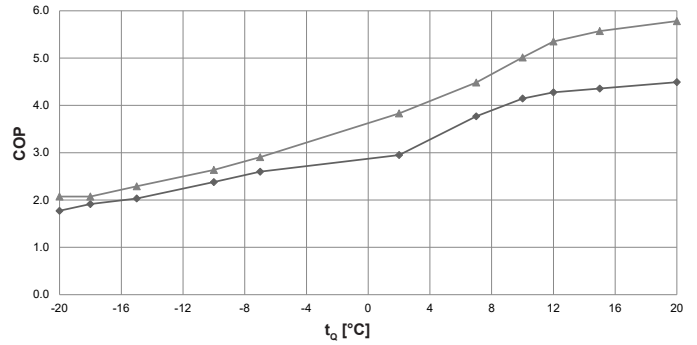
Coefficient of performance - t_{VL} 35 °C



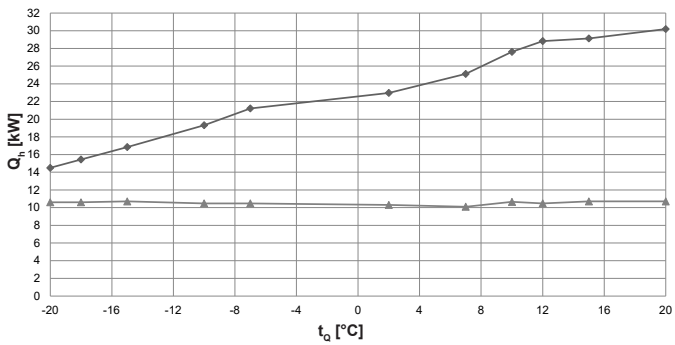
Heat output - t_{VL} 45 °C



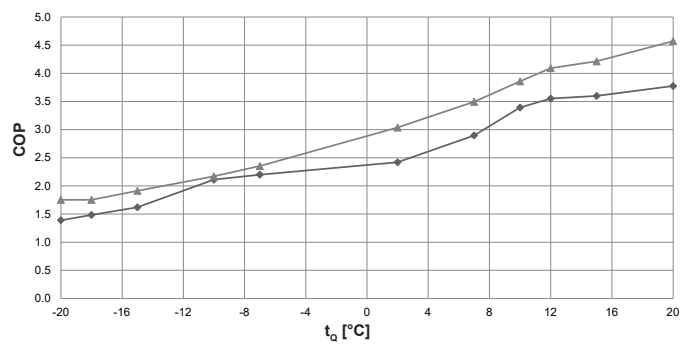
Coefficient of performance - t_{VL} 45 °C



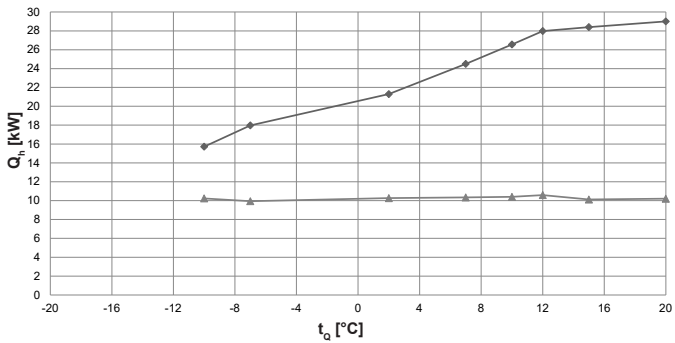
Heat output - t_{VL} 55 °C



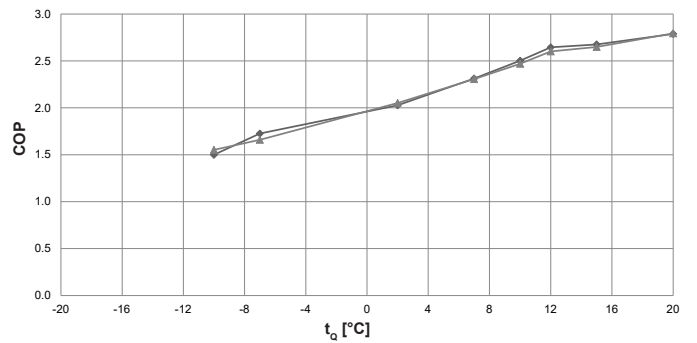
Coefficient of performance - t_{VL} 55 °C



Heat output - t_{VL} 70 °C



Coefficient of performance - t_{VL} 70 °C



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

t_o = source temperature (°C)

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

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

◆ Maximum output

▲ Minimum output

Performance data – heating

Belaria® pro (24)

Data according to EN 14511

t_{VL} °C	t_G °C	Maximum output			Minimum output		
		Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-20	16.0	8.4	1.9	10.0	4.0	2.5
	-18	17.6	8.4	2.1	10.0	4.0	2.5
	-15	18.8	8.5	2.2	10.0	3.5	2.8
	-10	20.7	7.3	2.9	10.0	3.2	3.2
	-7	22.1	7.7	2.9	10.5	3.0	3.5
	2	24.0	7.5	3.2	10.1	2.1	4.9
	7	27.4	6.0	4.6	9.9	1.7	5.8
	10	29.5	6.2	4.8	10.0	1.5	6.5
	12	30.5	6.3	4.9	10.0	1.4	7.0
	15	30.8	6.2	5.0	10.0	1.4	7.4
45	20	31.4	6.1	5.2	10.0	1.3	7.7
	-20	15.6	8.8	1.8	9.9	4.8	2.1
	-18	16.8	8.8	1.9	9.9	4.8	2.1
	-15	18.1	8.9	2.0	10.1	4.4	2.3
	-10	20.3	8.5	2.4	10.5	4.0	2.6
	-7	21.7	8.4	2.6	10.6	3.6	2.9
	2	23.7	8.0	3.0	10.4	2.7	3.8
	7	26.2	7.0	3.8	10.2	2.3	4.5
	10	28.8	6.9	4.1	10.4	2.1	5.0
	12	29.6	6.9	4.3	10.6	2.0	5.4
50	15	30.2	6.9	4.4	10.6	1.9	5.6
	20	31.0	6.9	4.5	10.7	1.9	5.8
	-20	15.0	9.7	1.5	11.0	5.2	1.9
	-18	16.1	9.6	1.7	10.0	5.2	1.9
	-15	17.5	9.7	1.8	10.0	4.8	2.1
	-10	19.8	8.8	2.2	10.0	4.4	2.4
	-7	21.7	9.1	2.4	10.0	4.0	2.6
	2	23.3	8.8	2.7	10.0	3.0	3.4
	7	25.7	7.8	3.3	10.0	2.6	4.0
	10	28.2	7.5	3.7	10.0	2.3	4.4
55	12	29.2	7.5	3.9	10.0	2.3	4.7
	15	29.6	7.5	3.9	10.0	2.2	4.9
	20	30.6	7.5	4.1	10.0	2.1	5.2
	-20	14.5	10.4	1.4	10.6	6.1	1.8
	-18	15.4	10.4	1.5	10.6	6.1	1.8
	-15	16.9	10.4	1.6	10.7	5.6	1.9
	-10	19.3	9.2	2.1	10.5	4.8	2.2
	-7	21.2	9.6	2.2	10.5	4.5	2.4
	2	23.0	9.5	2.4	10.3	3.4	3.0
	7	25.1	8.7	2.9	10.1	2.9	3.5
55	10	27.6	8.1	3.4	10.7	2.8	3.9
	12	28.8	8.1	3.6	10.5	2.6	4.1
	15	29.1	8.1	3.6	10.7	2.5	4.2
	20	30.2	8.0	3.8	10.7	2.3	4.6

Further performance data - heating
see next page

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

Observe daily power interruptions!
see "Engineering heat pumps general"

Performance data – heating

Belaria® pro (24)

Data according to EN 14511

t_{VL} °C	t_Q °C	Maximum output			Minimum output		
		Q_h kW	P kW	COP	Q_h kW	P kW	COP
60	-20	14.0	11.4	1.2	11.3	7.1	1.6
	-18	14.8	11.4	1.3	10.3	6.5	1.6
	-15	16.2	11.1	1.5	10.5	6.1	1.7
	-10	18.8	10.4	1.8	10.4	5.4	1.9
	-7	20.7	10.2	2.0	10.3	5.0	2.1
	2	22.6	10.2	2.2	9.7	4.1	2.4
	7	24.6	9.5	2.6	10.4	3.5	3.0
	10	27.0	8.7	3.1	10.3	3.2	3.3
	12	28.4	8.7	3.3	10.5	3.1	3.4
	15	28.6	8.7	3.3	10.5	3.0	3.5
70	20	29.7	8.5	3.5	10.5	2.8	4.0
	-10	15.7	10.5	1.5	10.2	6.6	1.6
	-7	18.0	10.4	1.7	9.9	6.0	1.7
	2	21.3	10.5	2.0	10.3	5.0	2.1
	7	24.5	10.6	2.3	10.3	4.5	2.3
	10	26.6	10.6	2.5	10.4	4.2	2.5
	12	28.0	10.6	2.6	10.6	4.1	2.6
	15	28.4	10.6	2.7	10.1	3.8	2.6
20	29.0	10.4	2.8	10.2	3.7	2.8	

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

t_Q = source temperature (°C)

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

P = power consumption, overall unit (kW)

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

Observe daily power interruptions!
see "Engineering heat pumps general"

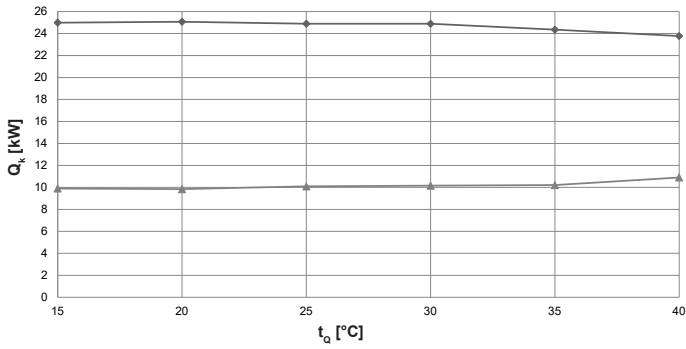
Performance data – cooling

Maximum cooling capacity

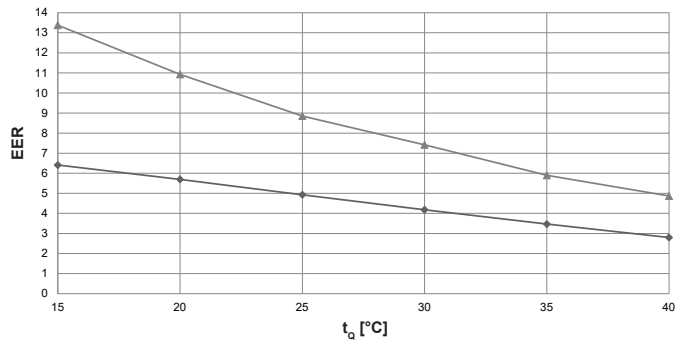
Belaria® pro (24)

Data according to EN 14511

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



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



◆ Maximum output
▲ Minimum output

Belaria® pro (24)

Data according to EN 14511

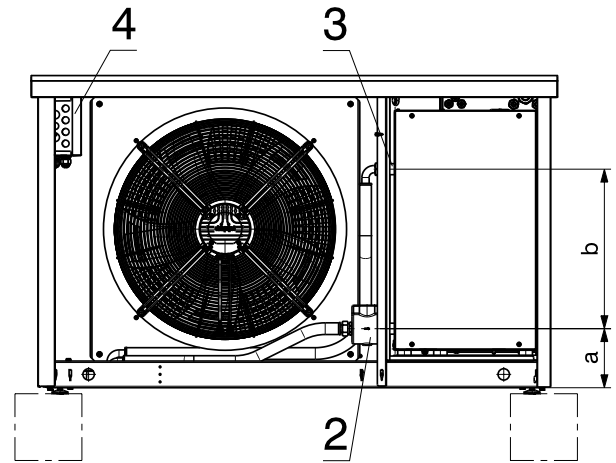
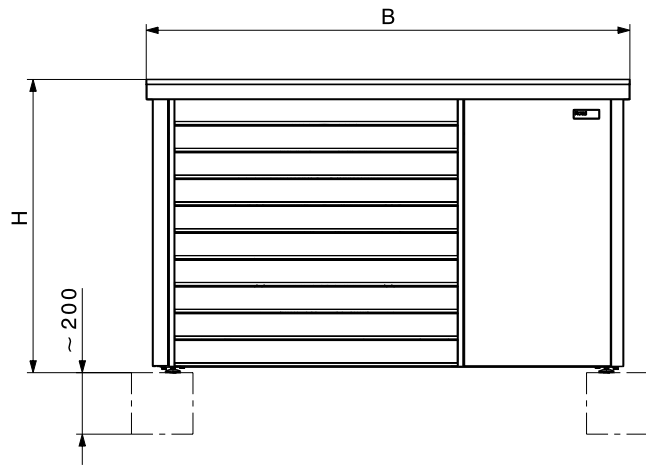
t_{VL} °C	t_0 °C	Maximum output			Minimum output		
		Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15	24.7	6.5	3.8	10.3	1.2	8.5
	20	25.0	8.2	3.1	10.4	1.5	6.8
	25	24.1	9.0	2.7	10.4	1.9	5.5
	30	23.4	9.5	2.5	10.4	2.8	3.7
	35	22.2	10.4	2.1	9.9	3.4	2.9
	40	19.4	10.5	1.9	9.7	4.9	2.0
12	15	25.2	5.1	5.0	9.9	1.0	10.4
	20	24.9	5.8	4.3	10.2	1.2	8.6
	25	25.0	6.8	3.7	10.4	1.5	6.9
	30	25.1	8.4	3.0	10.6	1.9	5.7
	35	24.4	9.9	2.5	10.6	2.3	4.7
	40	22.5	11.0	2.0	10.1	2.6	3.9
18	15	25.0	3.9	6.4	9.9	0.7	13.4
	20	25.1	4.4	5.7	9.8	0.9	10.9
	25	24.9	5.1	4.9	10.1	1.1	8.9
	30	24.9	6.0	4.2	10.2	1.4	7.4
	35	24.4	7.0	3.5	10.2	1.7	5.9
	40	23.8	8.5	2.8	10.9	2.2	4.9

t_{VL} = cooling water flow temperature (°C)
 t_0 = source temperature (°C)
 Q_k = cooling capacity (kW), measured in accordance with standard EN 14511
 P = power consumption, overall unit (kW)
 EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

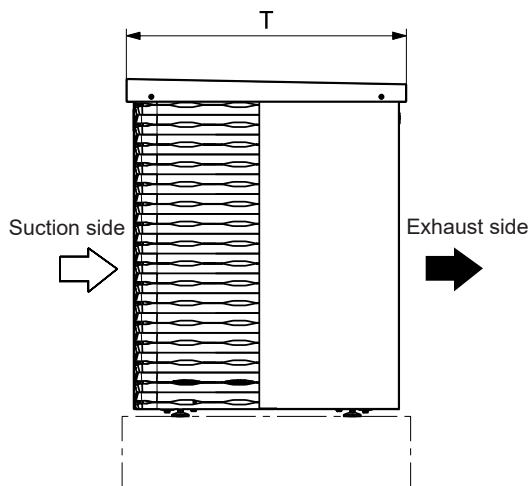
Observe daily power interruptions!
 see "Engineering heat pumps general"

Belaria® pro
Outdoor unit
 (Dimensions in mm)

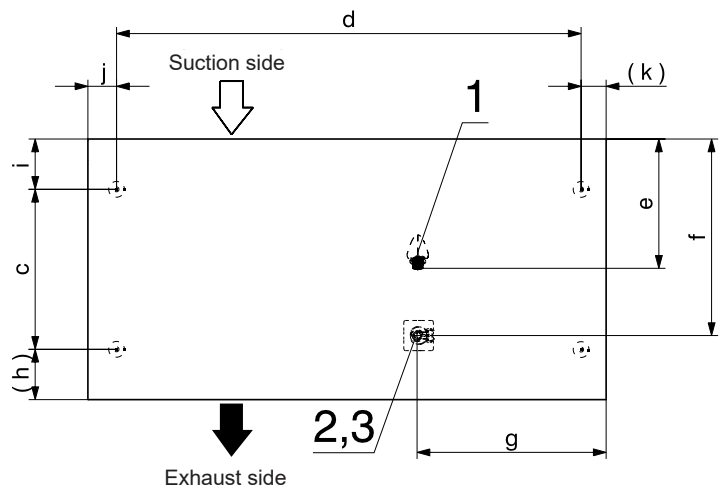
Front view



View from the left



View from top



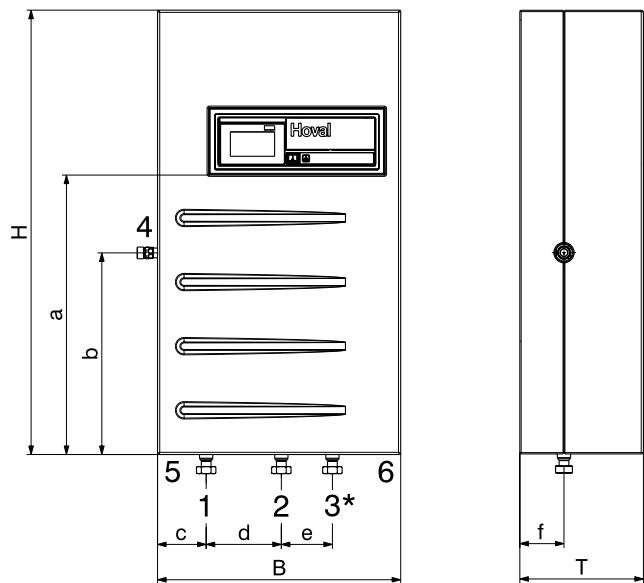
- 1 Condensate drain 1"
- 2 Connection hydraulic connection line return 1½" ext. thread
- 3 Connection hydraulic connection line flow 1½" ext. thread
- 4 Electrical connection

Type	H	B	T	a	b	c	d	e	f	g	h	i	j	k
Belaria® pro (24)	1461	1928	997	280	410	685	1750	380	800	760	150	160	100	80

Belaria® pro (24)

Indoor unit

(Dimensions in mm)

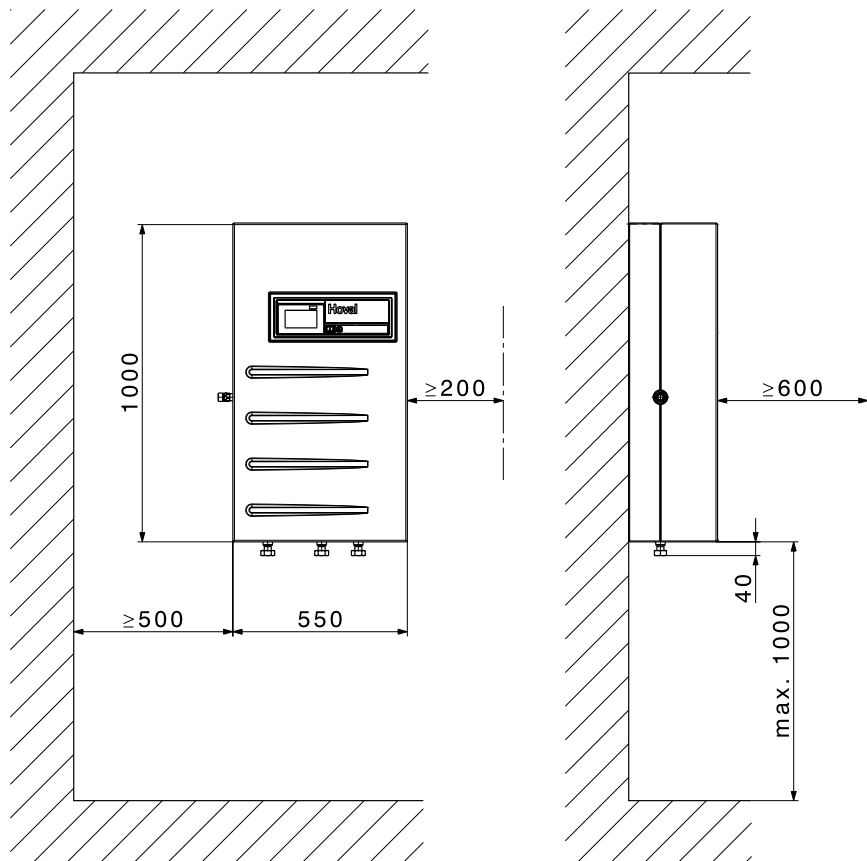


- 1 Flow outdoor unit (return not guided through indoor unit) 1½" ext. th.
- 2 Flow heating 1½" ext. th.
- 3* No connection with Belaria® pro (24)
- 4 Safety assembly (accessories) ¾" ext. th.
- 5 Cable feed-in sensors, RS485
- 6 Cable feed-in control current

Type	H	B	T	a	b	c	d	e	f
Belaria® pro (24)	1005	550	280	630	455	110	170	115	100

Belaria® pro (24)

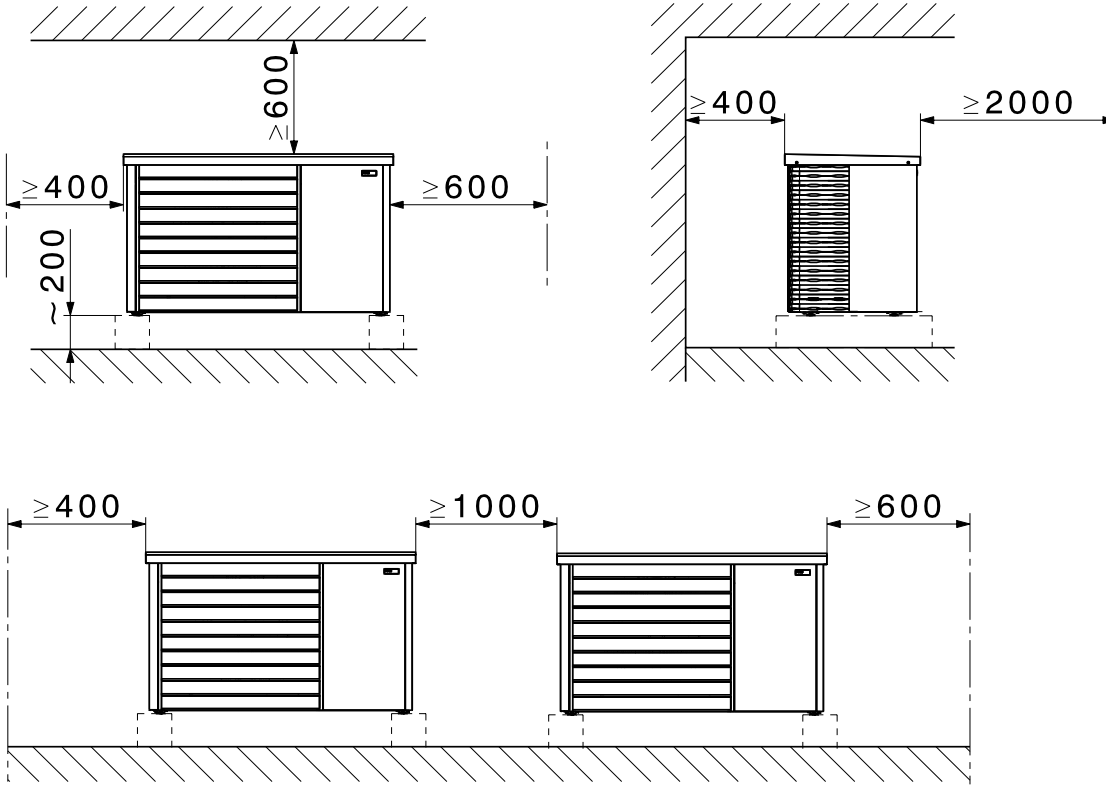
Indoor unit wall-mounted



To ensure good operability and accessibility to the electrical/hydraulic connections, a clearance of max. 1000 mm must be provided from the ground to the lower edge of the indoor unit.

Space requirement
(Dimensions in mm)

Belaria® pro
Outdoor unit

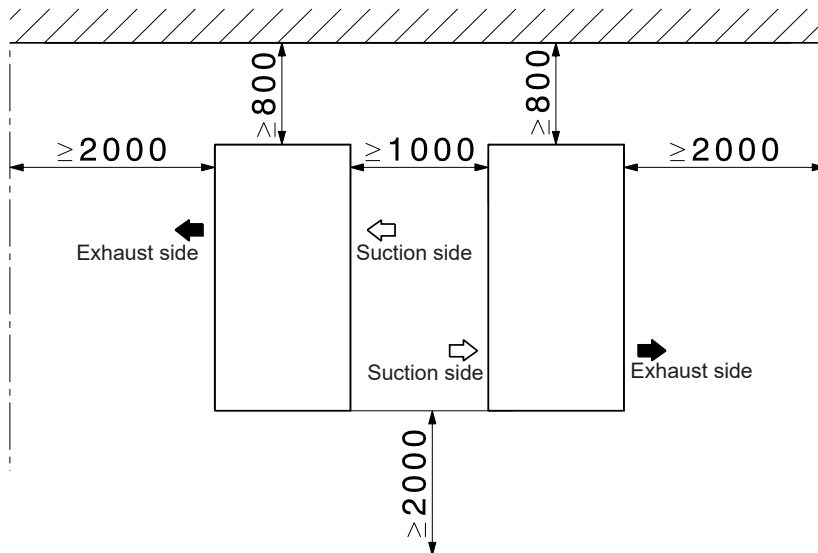


Any possible openings/recesses and ignition sources must be avoided within a radius of one meter around the outdoor unit.

In order to ensure accessibility during maintenance, a clearance of at least 600 mm upwards must be maintained. For any service work, the minimum clearances at the rear and sides of the heat pump must be observed.

Belaria® pro
Outdoor unit

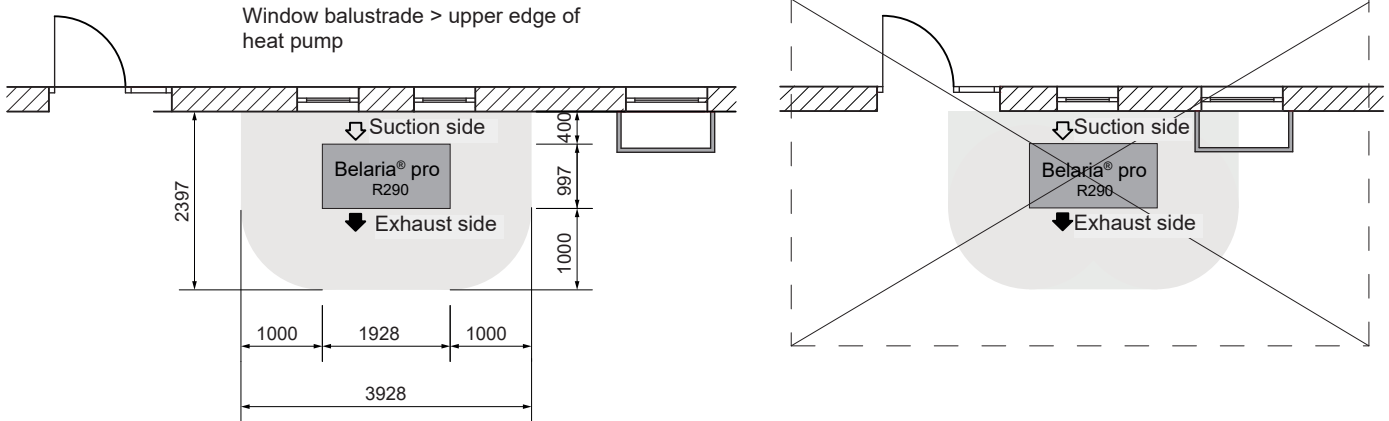
View from above



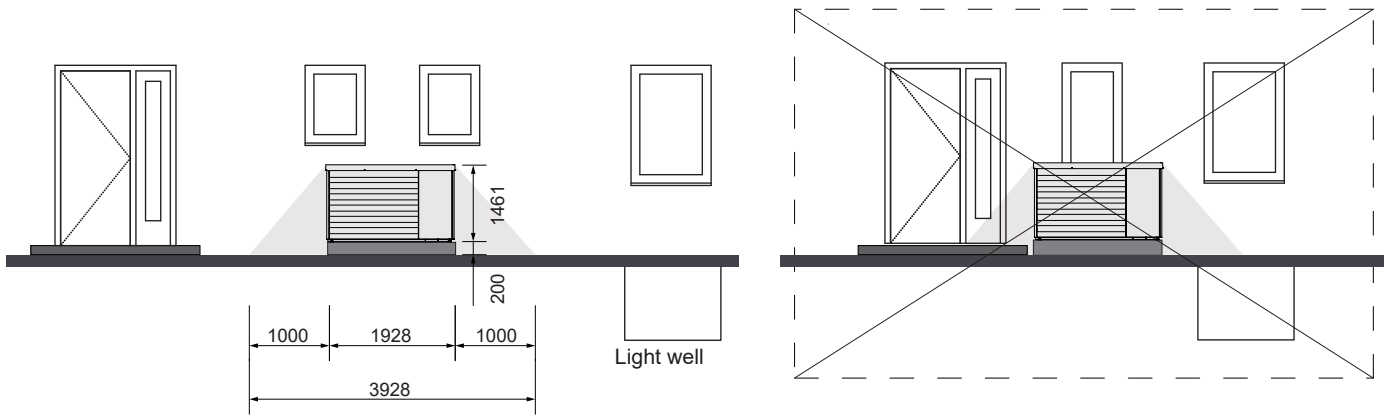
Presentation of protection zones

Belaria® pro with refrigerant R290
(Dimensions in mm)

Floor plan - protection zone when installed in front of a wall

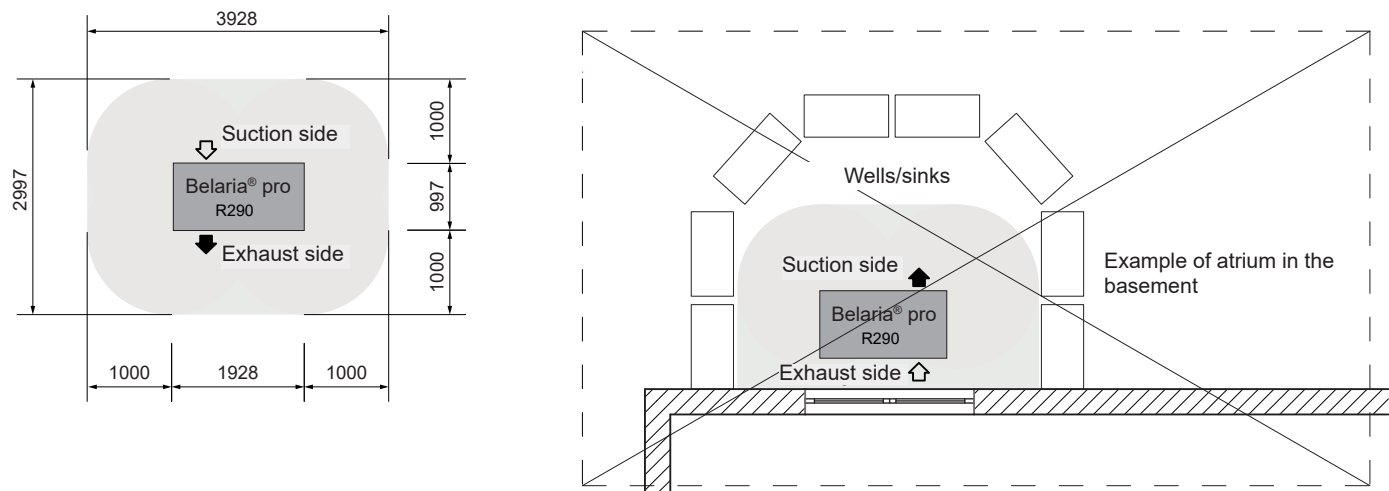


View - protection zone when installed in front of a wall

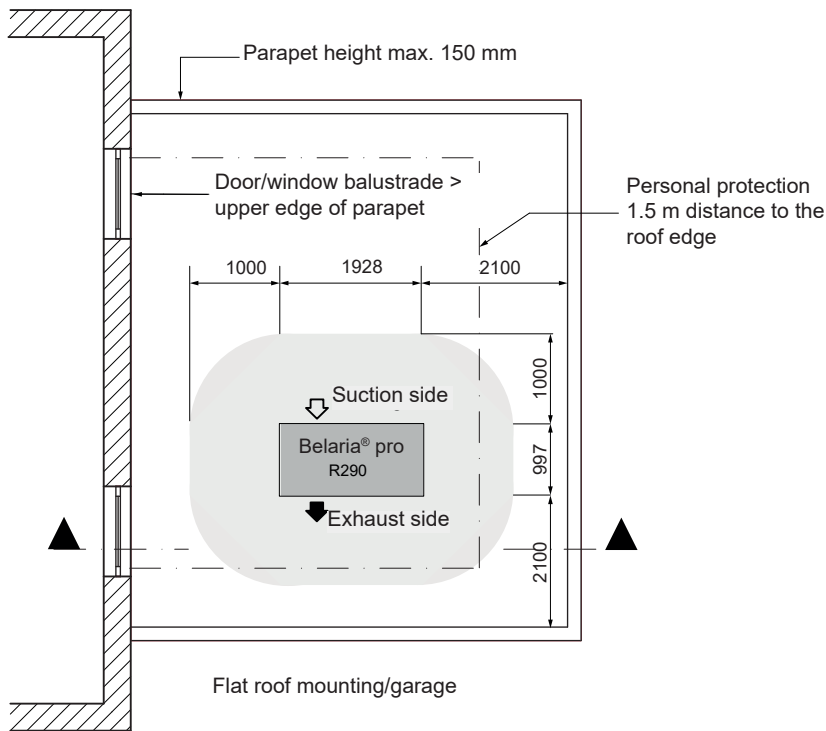


- There must be no building openings (windows, doors, shafts, ventilation openings, floor drains or the like) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Window balustrades must be higher than the upper edge of the outdoor unit in the protection zone!
- The heat pump must be at least 1 m from the property boundary; observe building regulations!
- At the entrances to properties, it must be ensured that no vehicle can enter the protection zone.

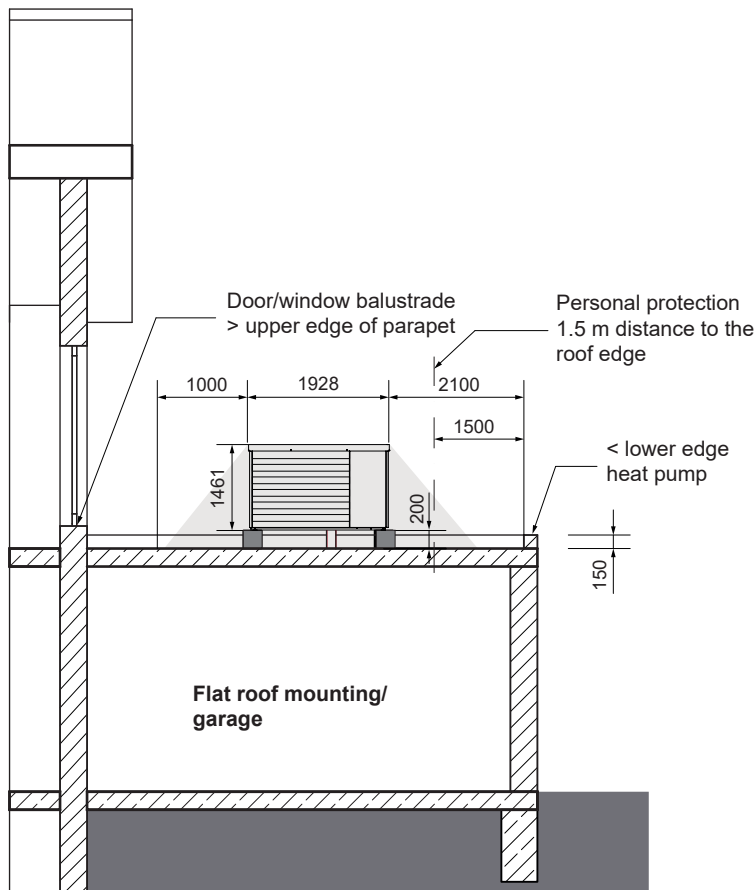
Floor plan - protection zone when installed outdoors



Floor plan flat roof - protection zone



Section flat roof - protection zone

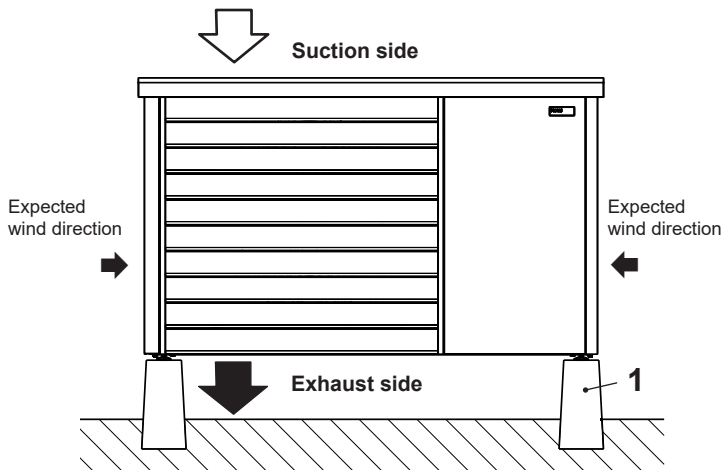


- Strict compliance with safety measures regarding combustible refrigerants.
- All standards concerning statics, wind load and access to roofs must be complied with. The outdoor unit must be firmly bolted onto the substructure (e.g. concrete base). The heat pump must be prevented from tilting.
- Minimum distance of the heat pump to the roof edge: 1.5 m (personal protection) + 0.6 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.
- There must be no floor-to-ceiling doors/windows to the flat roof, or balustrade must be higher than the parapet.
- Protection zones around windows must be complied with.
- There must not be any pipe vents, skylights or the like on the flat roof within a radius of 1 m from the heat pump.
- If there is a risk of frost, a siphon must be installed in the shaft immediately before the condensate drain is introduced into the downpipe.

Installation variants for Belaria® pro outdoor unit

(Dimensions in mm)

Firm base on site with strip foundation



1 Concrete base on site

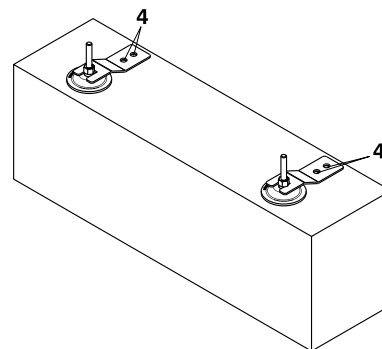
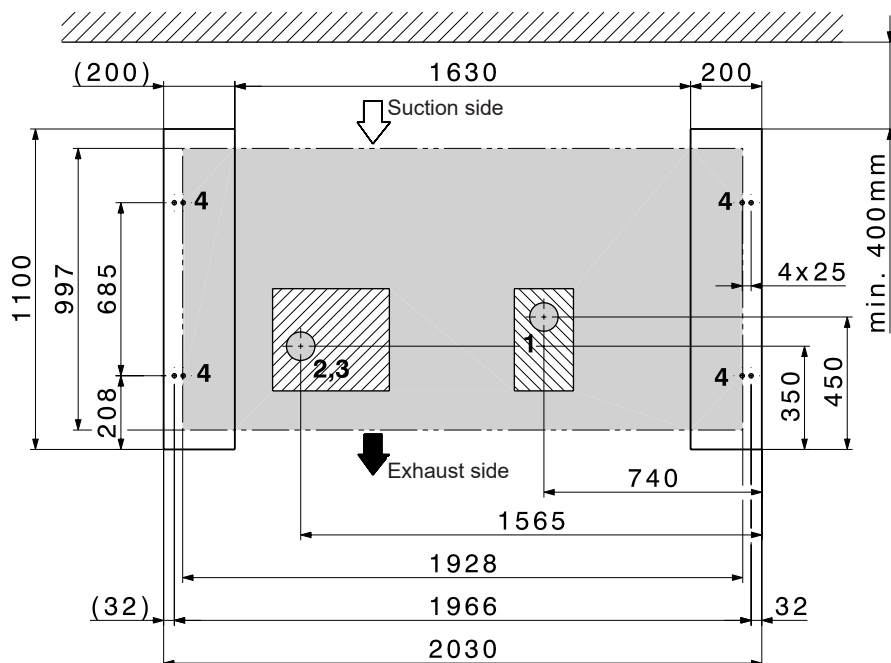
The base must not form a sink. A circumferential base is therefore not permitted.

Installation variants for Belaria® pro outdoor unit

(Dimensions in mm)

Strip foundation

Plan concrete base set
(view from above)



Attachment of the outdoor unit from the outside (laterally) using the supplied clamps. The clamps are visible. It is not necessary to remove the cladding sections.

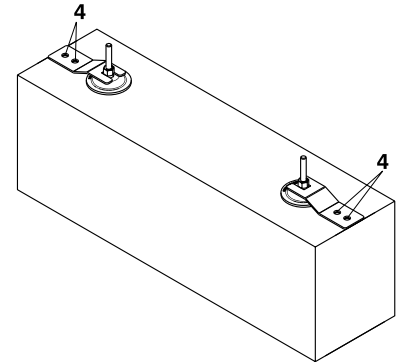
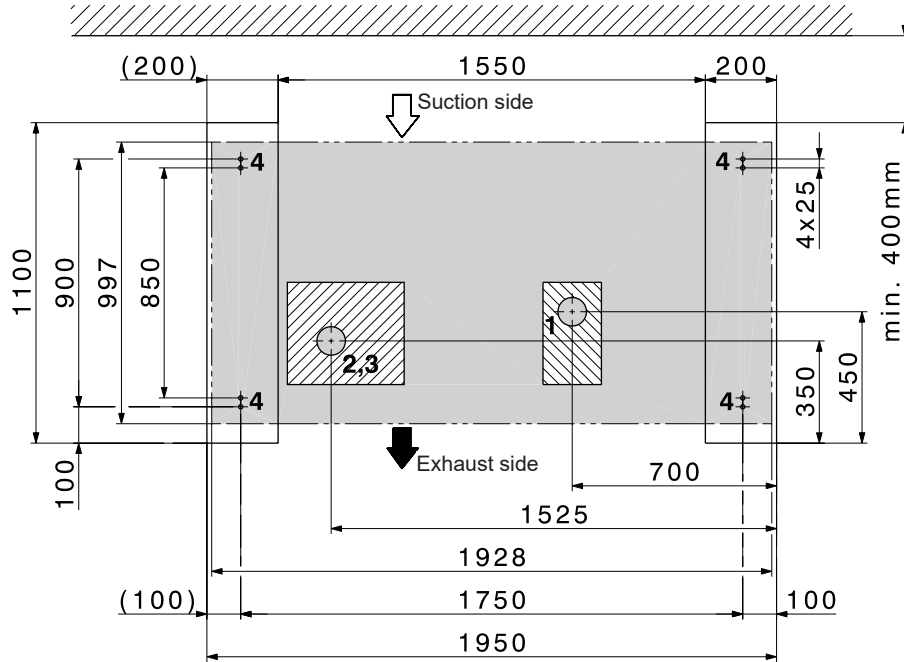
- Possible area for empty tubes in the concrete base
- Possible area for condensate drain in the concrete base

- 1 Condensate drain area
- 2 Area FL hydraulics
RT hydraulics
- 3 Electrics area
- 4 Attachment points M8 Belaria® pro (dowels in scope of delivery)

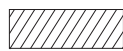
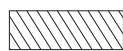
Installation variants for Belaria® pro outdoor unit
(Dimensions in mm)

Strip foundation

Plan concrete base set
(view from above)



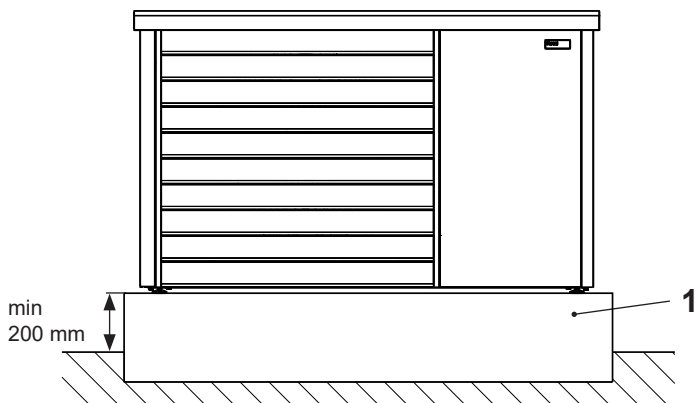
Attachment of the outdoor unit from the "inside/bottom" (grey area) of the heat pump using the supplied clamps. The clamps are not visible. It is necessary to remove the cladding sections.

-  Possible area for empty tubes in the concrete base
-  Possible area for condensate drain in the concrete base

- 1 Condensate drain area
- 2 Area FL hydraulics
RT hydraulics
- 3 Electrics area
- 4 Attachment points M8 Belaria® pro (dowels in scope of delivery)

Installation variants for Belaria® pro outdoor unit
(Dimensions in mm)

Firm base on site with floor plate

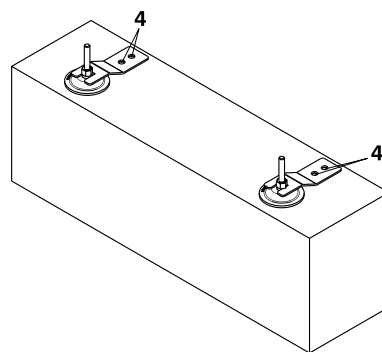
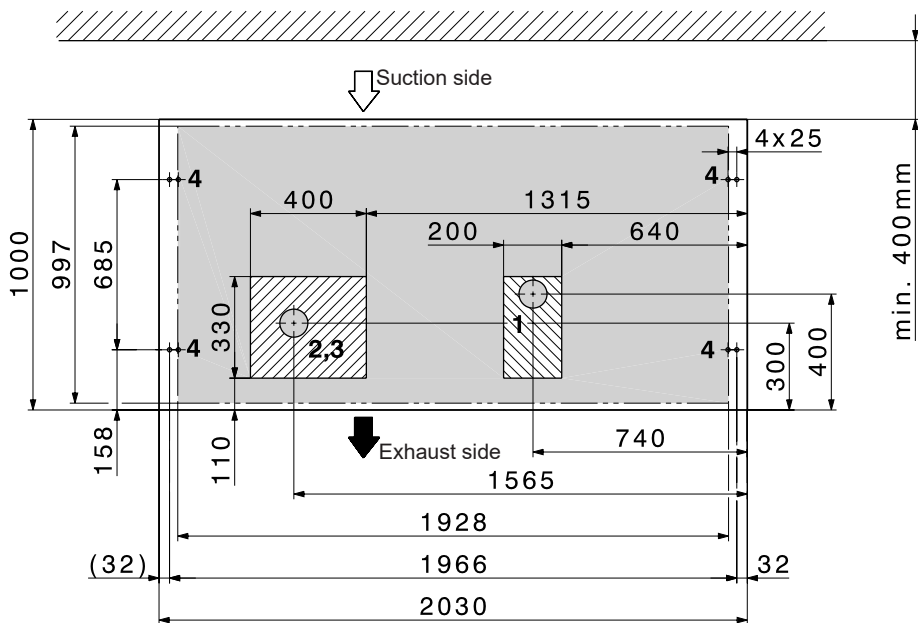


1 Floor plate on site

The base must not form a sink. A circumferential base is therefore not permitted.

Floor plate

Plan
(view from above)



Attachment of the outdoor unit from the outside (laterally) using the supplied clamps. The clamps are visible. It is not necessary to remove the cladding sections.

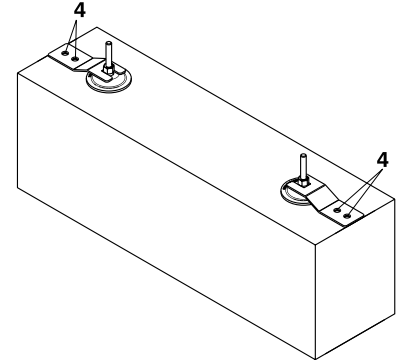
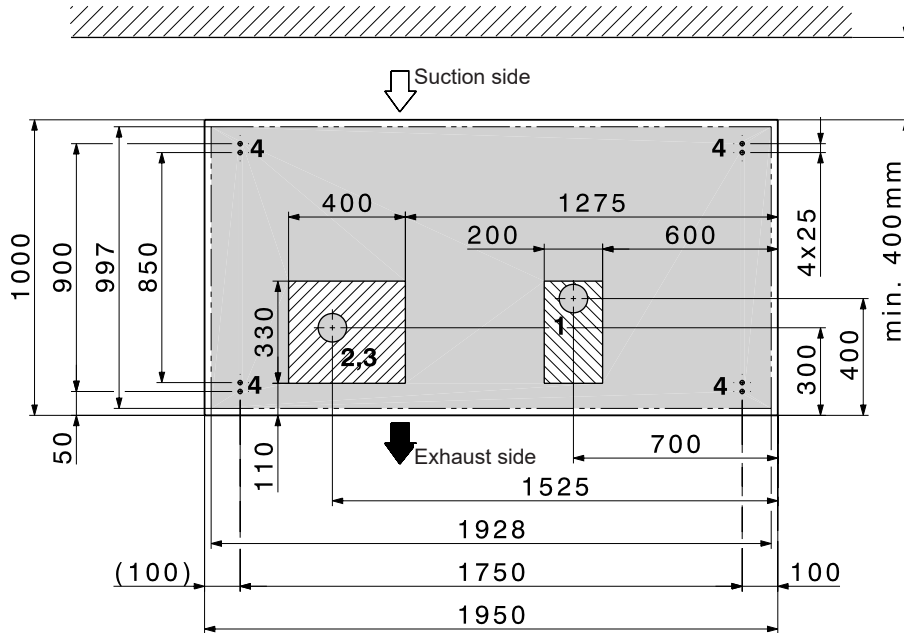
- Possible area for empty tubes in the concrete base
- Possible area for condensate drain in the concrete base

- 1 Condensate drain area
- 2 Area FL hydraulics
RT hydraulics
- 3 Electrics area
- 4 Attachment points M8 Belaria® pro (dowels in scope of delivery)


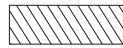
Installation variants for Belaria® pro outdoor unit
(Dimensions in mm)

Floor plate

Plan
(view from above)

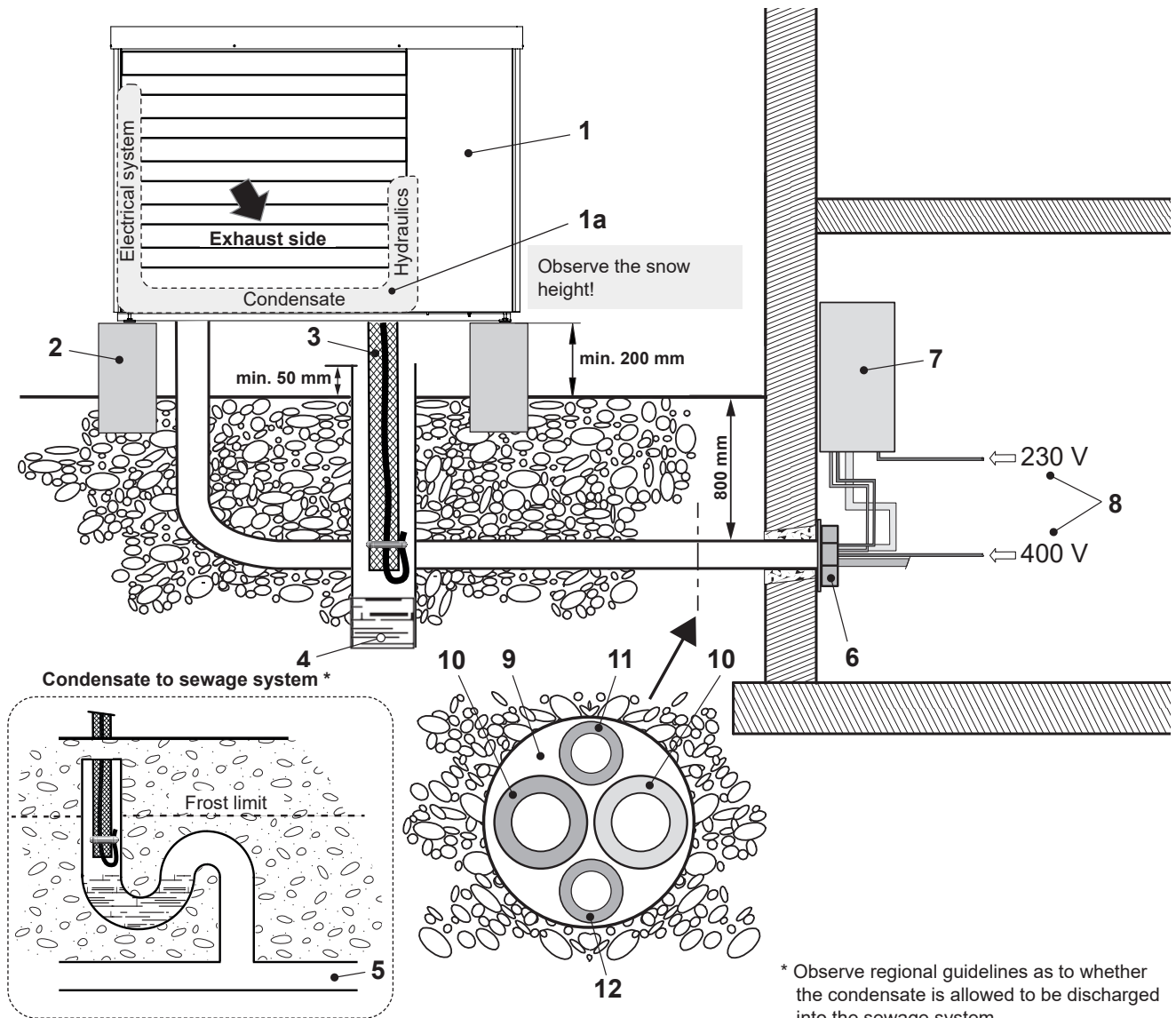


Attachment of the outdoor unit from the "inside/bottom" (grey area) of the heat pump using the supplied clamps. The clamps are not visible. It is necessary to remove the cladding sections.

-  Possible area for empty tubes in the concrete base
-  Possible area for condensate drain in the concrete base

- 1 Condensate drain area
- 2 Area FL hydraulics
RT hydraulics
- 3 Electrics area
- 4 Attachment points M8 Belaria® pro (dowels in scope of delivery)

Configuration and connection diagram Belaria® pro (24)



- 1 Outdoor unit
- 1 a Space for connection of hydraulics (FL + RT), condensate drain and electrics.
- 2 Concrete base
- 3 Condensate drain heat pump, drain pipe DN 100
- 4 Variant 1: Seepage (duct/gravel layer)
- 5 Variant 2: Discharging into the sewage system (penetration into the soil must be made leak-tight)
- 6 Wall bushing (hydraulic and electrical connections)
- 7 Belaria® pro (24) indoor unit
- 8 Main current:
3 x 400 V/50 Hz
Control current:
1 x 230 V/50 Hz
Electric heating element main current:
3 x 400 V/50 Hz
Network cables (optional)
- 9 Empty tube for hydraulics and electrics
- 10 Connection line FL + RT
- 11 Empty tube for electrical connections for outdoor unit
Main current outdoor unit: 3 x 400 V/50 Hz
Outdoor unit control current: 1 x 230 V/50 Hz
- 12 Empty tube for data bus RS485

* Observe regional guidelines as to whether the condensate is allowed to be discharged into the sewage system.

Requirements and directives

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

Set-up

- The distance between the indoor and outdoor unit must be as short as possible. Only short and simple routing of lines guarantees cost effectiveness and low heat losses.
- The maximum permitted single cable length is 30 m between the outdoor unit, via the indoor unit and the heating storage tank. This must not be exceeded.
- There must be no building openings (windows, doors, shafts, ventilation openings, etc.) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Wall ducts into the building must be airtight.
- The outdoor unit must not be placed in or near floor recesses.
- The outdoor unit 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 blocked. The air outlet side must be the side facing away from the building and unobstructed (> 2 m).
- Due to efficient water heating, the line length with the Belaria® pro between the calorifier and the indoor unit is not allowed to be more than 10 m.

Outdoor unit

The outdoor unit is installed outdoors. The installation location must be selected carefully. It is essential that the following ancillary conditions are met:

- The maximum line length according to the installation must not be exceeded.
- The connection lines must be laid insulated and frost-proof.
- 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), hedges and bushes can have a sound-absorbing effect.
- Unobstructed air inflow and outflow must be possible.
- 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 outdoor unit must be installed on a load-bearing fixed structure.
- If the unit 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 crossways to the suction direction of the outdoor unit.
- 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, or additional fastening should be provided for the outdoor unit.
- If the installation location is not protected against snowfall, it must be chosen in such a way that the evaporator remains free of snow.

- The outdoor unit must always be installed on a solid surface in a horizontal position. This can be achieved by means of concrete bases or a floor plate.
- The load-bearing capability must be adequate. The unit must be fixed with 4 M8 screws.
- Air heat pumps generate condensate during operation. This can amount to 10 litres per defrost cycle within 2 minutes for the outdoor unit of the Belaria® pro.
- The condensate drain must be frost-proof so that the condensate can flow away without problems even at outdoor temperatures below 0 °C.
- If the discharge is into the sewage system, a siphon must be provided and the duct lead-through into the ground must be sealed so that no refrigerant can enter the sewage system uncontrolled.
- If there is a risk of frost, a siphon must be installed in the shaft immediately before the condensate drain is introduced into the downpipe.
- The condensate trough included in the outdoor unit is already equipped with a tank heater at the factory and thus prevents freezing.
- The condensate drain line is also secured with the preassembled heating tape.
- The air outlet has increased susceptibility to frost. Gutters, water pipes and water containers must not be situated right next to the outlet.
- If installed near the coast, the location must be at least 5 km from the coastline. If this safe distance is not complied with, increased corrosion can be expected. These cases are excluded from the warranty.
- 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 sound-insulating hoses.

Flat roof installation

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

- Strict compliance with safety measures regarding flammable refrigerants (see below).
- All standards concerning statics, wind load and access to roofs must be complied with. The outdoor unit 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) + 0.6 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.

Safety measures to be complied with

- There must be no building openings (windows, doors, shafts, ventilation openings, floor drains, etc.) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Wall or ceiling ducts into the building must be airtight.
- The outdoor unit must not be placed in or near floor recesses.
- The outdoor unit 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 blocked. The air outlet side must be the side facing away from the building and unobstructed (> 2 m).
- The condensate is allowed to be directed into a shaft. A siphon must be installed upstream of the connection to the downpipe. The siphon must be located inside the building.

Indoor unit

- The installation location must be selected in accordance with the valid requirements and directives.
- The indoor unit must be installed in a room protected against frost, by an approved specialist company. Room temperature must be between 5 °C and 25 °C.
- Installation in wet rooms, dusty rooms or rooms with a potentially explosive atmosphere is not permitted.
- To minimise vibration and noise inside the building, the inside of the heat pump should be isolated as well as possible from the building structure. For example, indoor units should never be installed on lightweight ceilings/floors.
- The connections for the heat pump or heating flow are located at the bottom of the Belaria® pro indoor unit.
- Due to the accessibility to the hydraulic system, the distances must be maintained on all sides (see Dimensions/Space requirements).
- 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.

The installation of a sludge separator in the return of the outdoor unit is mandatory.

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.
- A fault-current circuit breaker is recommended. 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 pump.
- This fault-current circuit breaker must be of the all-current-sensitive type B (I_{ΔN} ≥ 300 mA). The specified RCCB types apply to the heat pump regardless of externally connected components (refer to assembly instructions, data sheets).
- Owing to the starting currents that occur, circuit breakers with a type “C” or “K” tripping characteristic are to be used for the main circuit.
- For the control circuit and additional electric heating (if present), circuit breakers with a type “B” or “Z” tripping characteristic are sufficient.
- 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, observing the fire protection regulations.

Routing of the hydraulic connection lines

- If the hydraulic connection lines are laid in the ground, this must be done in a protective tube. For example, this can be a PVC pipe with a diameter of 150 mm.
- 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.
- Care must be taken to ensure that water pipes do not pass through the sleeping or living areas.

- Shut-off valves must be installed on site in accordance with the corresponding hydraulic diagram. The shut-off valves are not allowed to be opened until immediately before commissioning.
- The danger of frost damage must be taken into account if there are prolonged power outages.

Room cooling

- Room cooling can be provided by fan convectors and is recommended. The connection lines for the fan convectors must have condensation-proof insulation. In addition, the condensate from the fan convectors must be drained off.
- If panel heating is used for room cooling, various criteria such as temperatures below the dewpoint or the temperature profiles must be allowed for, and can lead to costly consequential damage in the case of inadequate planning or incorrect use. We recommend that you consult Hoval.

Further guidelines
see “Engineering”

Connection on drinking water side

- The hydraulic connection is made according to the information in the corresponding diagrams from Hoval.
- According to the Drinking Water Regulation and DIN 50930-6, the domestic hot water storage tank is suitable for normal drinking water (pH value > 7.3).
- The connection piping can be made using galvanised pipes, stainless steel pipes, copper pipes or plastic pipes.
- The connections must be made pressure-tight.
- The safety devices tested for the components in accordance with DIN 1988 and DIN 4753 must be installed in the cold water pipe.
- The 10 bar operating pressure stated on the data plate is not allowed to be exceeded. Install a pressure reducing valve if necessary.
- A suitable water filter must be installed in the cold water pipe.
- A water softener must be installed if the water is hard.

Installation on heating side

- All pertinent laws, regulations and standards for heating house pipework and for heat pump systems must be complied with.
- It is imperative that a sludge separator is installed in the heating return upstream from the heat pump.

- 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 possibilities must be provided at the highest points and drainage possibilities 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 outdoor unit for damage. If the outdoor unit 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 outdoor unit 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 outdoor unit must not be stored in closed rooms, cellars or garages.
- The outdoor unit 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).
- Transport by crane: The outdoor unit can be lifted by a crane and carried to the installation site. For this purpose, there are three stiffening brackets below the cover with openings for the passage of the transport straps.

Looking for the appropriate hydraulic schematic?
Please contact your local Hoval partner.