Air/water heat pumps

Split version
modulating

Indoor installation
modulating

Indoor installation
two-stage

Outdoor installation
two-stage

Brine/water or water/water heat pumps

Indoor installation modulating

Hoval UltraSource® T comfort **1.8-17.6 kW**
Hoval UltraSource® T compact **1.8-13.3 kW**

Indoor installation single-stage

Hoval Thermalia® comfort **9.6-22.3 kW**

Indoor installation two-stage

Hoval Thermalia® twin **6.7-55.4 kW**

Hoval Thermalia® dual **17.5-181.1 kW**

Fan convector

Engineering

Hoval UltraSource® B comfort C
Hoval UltraSource® B compact C

Modulating heat pump system for heating and cooling in the living area. UltraSource® B compact C (8/200) and (11/200) additionally with integrated calorifier (200 litres) in the indoor unit.

Indoor unit UltraSource® B comfort C

- Compact floor-mounted air/water heat pump
- UltraSource® B comfort C (8) with modulating rotary compressor
  UltraSource® B comfort C (11,17) with modulating scroll compressor
- Casing made from painted, galvanised sheet steel. Colour flame red/brown red (RAL 3000/RAL 3011)
- Plate-type condenser made of stainless steel/copper
- Integrated components:
  - Speed-regulated high-efficiency pump
  - Flow sensor/heat meter
  - Electric heating element 1 to 6 kW
  - 3-way switching ball valve for heating/domestic hot water (see accessories for domestic hot water set)
- With cooling function with corresponding hydraulics
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- TopTronic® E controller installed
- Hydraulic connections
  - Heating connections 1″ left or right side. See accessories for connecting hoses
- Refrigerant connection lines can be connected at rear
- Electrical connections at rear

Indoor unit UltraSource® B compact C

- Compact floor-mounted air/water heat pump
- UltraSource® B compact C (8/200) with modulating rotary compressor
  UltraSource® B compact C (11/200) with modulating scroll enclosed compressor
- Casing made from painted, galvanised sheet steel. Colour flame red/brown red (RAL 3000/RAL 3011)
- Plate-type condenser made of stainless steel/copper
- Integrated calorifier 200 litres (can be divided for easier transport into the building; dimensions 1294 x 770 x 602 mm)
- Enamel painted calorifier with PU hard-foam insulation energy efficiency class A, load profile XL. Maintenance flange and magnesium protection anode built in
- Integrated components:
  - Speed-regulated high-efficiency pump
  - Flow sensor/flow meter or heat meter
  - Electric heating element 1 to 6 kW
- With cooling function with corresponding hydraulics
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”

Model range

UltraSource® B comfort C type	35 °C	55 °C	Heat output [1] A-7W35 kW	Heat output [1] A2W35 kW	Cooling capacity [1] A35W18 kW
(8)	A+++	A++	2.0-6.0	2.1-7.6	2.9-8.9
(11)	A+++	A++	2.8-10.0	2.8-10.2	3.5-11.0
(17)	A+++	A+++	6.0-14.8	6.0-17.4	6.2-17.7

UltraSource® B compact C type	35 °C	55 °C	Heat output [1] A-7W35 kW	Heat output [1] A2W35 kW	Cooling capacity [1] A35W18 kW
(8/200)	A+++	A++ A	2.0-6.0	2.1-7.6	2.9-8.9
(11/200)	A+++	A++ A	2.8-10.0	2.8-10.2	3.5-11.0

Energy efficiency class of the compound system with control
[1] Modulation range

- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- TopTronic® E controller installed
- Internally decoupled against solid-borne noise and can be connected directly
- Hydraulic connections
  - Heating connections 1″ top
  - Hot and cold water connections ¾″ top
- Refrigerant connection lines can be connected at right or left side
- Electrical connections at top

Outdoor unit

- Elegant and extremely quiet outdoor unit
- Compact unit for outdoor installation
- Housing with sheet metal enclosure, powder-coated, anthracite colour (DB 703)
- U-shaped louvre-type evaporator
- Speed-controlled axial fan with FlowGrid (inlet grille)
- Condensate tray incl. tray heating for channelling all the condensate in the outdoor unit, fixed installation, connection 1″ accessible from below
- Refrigerant line connections can be connected underneath
  - Suction gas line 16 mm
  - Liquid line 12 mm
- Electrical connections on left side, lead-in from underneath
  - 230 V control current, supplied from the indoor unit
  - Data cable - bus connection to the indoor unit

TopTronic® E controller

Control panel

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

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
  - Universal module expansion or
  - Heat balancing module expansion
- 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 in the indoor unit supplied loose

On site
- Masonry penetrations for refrigerant connection line
- Electrical connection line outdoor/indoor unit

Air/water heat pump

Hoval UltraSource® B comfort C

UltraSource® B comfort C Type	Heat output [1] A-7W35 kW	A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8)	2.0-6.0	2.1-7.6	2.9-8.9	7016 659
(11)	2.8-10.0	2.8-10.2	3.5-11.0	7016 662
(17)	6.0-14.8	6.0-17.4	6.2-17.7	7016 665

[1] Modulation range

Hose set SPCH25-25-10-2 6058 817
for UltraSource® B cf C (8-17) and
Belaria® comfort ICM (8)
Consisting of:
- 2 reinforced hoses PN 10 DN 25 1″ IT
insulated for heating side
flat-sealing with union nut
- Length: 1.0 m
- 2 brackets DN 25
- Seals

Hoval UltraSource® B compact C
with integrated 200 litre calorifier

UltraSource® B compact C Type	Heat output [1] A-7W35 kW	A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8/200)	2.0-6.0	2.1-7.6	2.9-8.9	7016 660
(11/200)	2.8-10.0	2.8-10.2	3.5-11.0	7016 663

[1] Modulation range

Energy efficiency class
see “Description”

No hose set necessary

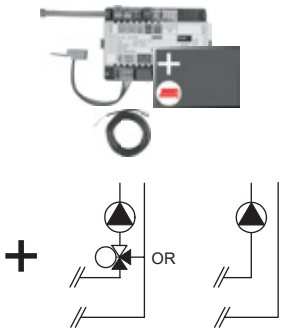
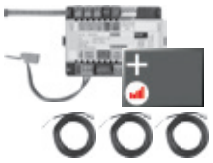
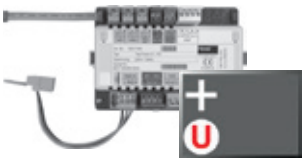
EnergyManager PV smart
Free feature to increase self-generated power consumption in use with HovalConnect.

Further information
see “Description”

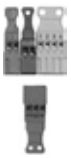
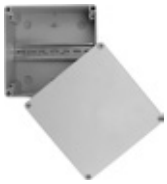
Electric heating elements
see “Calorifiers” -
chapter “Electric heating elements”

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
	**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!	6034 576
	**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	6037 062
	**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.	6034 575

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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”

Heating/cooling accessories

		Part No.
	Diaphragm pressure expansion tanks see “Various system components”	
	**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
	**Connection set AS32-2/H** for compact mounting of all required fittings of a direct circuit consisting of: 2 thermometer ball valves Wall bracket included separately Connection T-piece DN 32 in the return flow for connecting the sludge separator CS 32 bottom and the diaphragm pressure expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**Differential pressure relief valve DN 20** for free installation with flexible centre distance Connections at both ends 1″ external thread Operating pressure: max. 10 bar Operating temperature: max. 120 °C Setting range: 0.05-0.5 bar Length: 93 mm Casing made of brass with setting handle made of plastic	240 554
	**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
	Strainers see “Various system components”	

System water protection filter FGM025-200 — Part No. 6058 256

For horizontal installation in return
For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop
Consisting of:
- Filter head and bowl in brass
- Magnetic insert (nickel-neodymium)
- 2 pressure gauges
- Very large 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 (Δp < 0.1 bar): 5.5 m³/h
Weight: 6.8 kg
Water temperature: max. 90 °C
- incl. steam diffusion-tight insulating shells

Notice
Fulfills the function of sludge separator and strainer

Additional sludge separators
see “Various system components”

Dew point switch FAS — Part No. 2070 911

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

Vibration decoupler

for reducing structure-borne noise from heat pumps in the indoor area
Consisting of:
- 1 vibration decoupler insulated for heating side flat-sealing with union nut
- 2 flat seals

Nominal pressure: PN 10

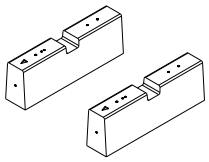
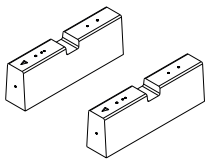
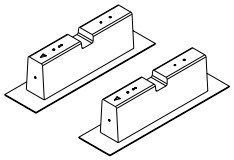
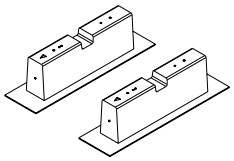
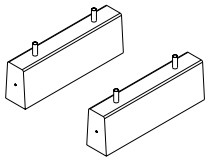
Dimension	Connection inches	Nominal length mm	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Domestic hot water accessories

		Part No.
	**Domestic hot water set SPW25-25-10-1MD** for UltraSource® B comfort C (8-17), Belaria® comfort ICM (8) and UltraSource® T comfort (8-17) Consisting of: - 1 actuator for installed 3-way switching ball valve for heating/ domestic hot water - 1 reinforced hose PN 10 DN 25 1″ IT insulated for domestic hot water side flat-sealing with union nut - Length: 1.0 m - Seals	6058 815
	**Correx® impressed current anode** for UltraSource® B compact C, UltraSource® T compact for long-term corrosion protection for installation in the enamelled calorifier	6046 662

In every case, either a Correx® impressed current anode or a magnesium anode may be used.

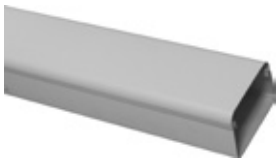
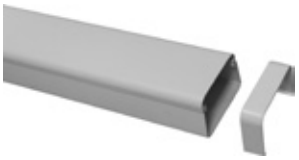
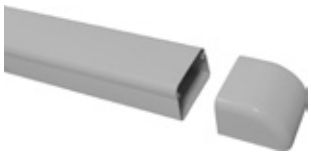
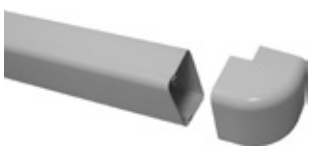
Outdoor unit accessories

		Part No.
	**Concrete base set BSW02-FU** for Belaria® pro (8-15) and UltraSource® B (8,11) for safe installation of an outdoor unit on a firm base Consisting of: 2 concrete bases with cast-in fastening sleeves M8 and M10 Dimensions (H x W x D): 250 x 750 x 150 mm Weight: 2 pieces of 57 kg	6054 856
	**Concrete base set BSW01-FU** for UltraSource® B comfort C (17) and Daikin Altherma 3 H HT W (14,18) for safe installation of an outdoor unit on a firm base Consisting of: 2 concrete bases with cast-in fastening sleeves, screw set Dimensions (H x W x D): 250 x 750 x 150 mm Weight: 2 pieces of 58 kg	6046 157
	**Concrete base set BSW02-FD** for Belaria® pro (8-15) and UltraSource® B (8,11) for safe installation of an outdoor unit on the flat roof. Consisting of: 2 concrete bases with cast-in fastening sleeves M8 and M10 Protective mats with aluminium lining Dimensions (H x W x D): 250 x 750 x 150 mm Weight: 2 pieces of 57 kg	6054 857
	**Concrete base set BSW01-FD** for UltraSource® B comfort C (17) and Daikin Altherma 3 H HT W (14,18) for safe installation of an outdoor unit on the flat roof Consisting of: 2 concrete bases with cast-in fastening sleeves, protective mats with aluminium lining, screw set Dimensions (H x W x D): 250 x 750 x 150 mm Weight: 2 pieces of 58 kg	6046 158
	**Concrete base set BSW01-ZS** for safe installation of an outdoor unit in drainage bed for gardens and meadows. Additional base height 250 mm for plug combination with concrete base set BSW01-FU and BSW02-FU Consisting of: 2 additional concrete bases, screw set Dimensions (H x W x D): 250 x 750 x 150 mm Weight: 2 pieces of 58 kg	6046 159

Notice
In a flat roof installation, all standards concerning statics, wind load and access to roofs must be complied with.

For further information
see “Engineering” chapter

		Part No.
	**Vibration damper set M10** for installing the unit on a concrete base.	6043 779
	**Composite anchor cartridge HVU2 M10 x 90** for anchor rod HAS-U M10x190 GV for heavy load anchoring in concrete Pack of 20 incl. screw adapter	2077 465
	**Composite anchor cartridge HVU2 M12 x 110** for anchor rod HAS-U M12 x 220 GV for heavy load anchoring in concrete Pack of 20 incl. screw adapter	2077 466
	**Anchor rod HAS-U M10 x 190 GV** for use with composite anchor cartridge for fastening in concrete and masonry Galvanised steel, pack of 20	2077 467
	**Anchor rod HAS-U M12 x 220 GV** for use with composite anchor cartridge for fastening in concrete and masonry Galvanised steel, pack of 20	2077 468

		Part No.
	**Cable duct, PVC, RAL 9010 pure white** 125 x 75 mm, length 2 m	2075 314
	**Holding clip adjustable** for cable duct 125 x 75 mm	2075 315
	**Connector, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 316
	**End piece, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 317
	**Straight end, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 318
	**Angled end, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 319
	**Inner angle, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 320
	**Outer angle, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 321
	**Flat arch, PVC, RAL 9010 pure white** for cable duct 125 x 75 mm	2075 322

UltraSource® B comfort C (8-17)
UltraSource® B compact C (8/200), (11/200)

Type		(8) (8/200)	(11) (11/200)	(17)
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	A+++/A+++
• Energy efficiency class load profile XL UltraSource® B compact C	Hot water	A	A	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	202	176	206
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	146	135	152
• Water heating energy efficiency consumption profile/ηwh 35 °C/55 °C	-/%	XL/96	XL/100	-/-
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.1/3.7	4.5/3.4	5.2/3.9
Max./min. performance data heating and cooling in acc. with EN 14511				
• Max. heat output A2W35	kW	7.6	10.2	17.4
• Max. heat output A-7W35	kW	6.0	10.0	14.8
• Max. heat output A15W35	kW	2.6	4.0	6.1
• Max. cooling capacity A35W18	kW	8.9	11.0	17.7
• Max. cooling capacity A35W7	kW	6.3	8.6	14.2
• Max. cooling capacity A35W18	kW	2.9	3.5	6.2
Nominal performance data heating in acc. with EN 14511				
• Nominal heat output A2W35	kW	3.9	5.9	11.3
• Coefficient of performance A2W35	COP	4.4	4.4	4.5
• Nominal heat output A7W35	kW	4.5	6.8	12.8
• Coefficient of performance A7W35	COP	5.2	5.1	5.1
• Nominal heat output A-7W35	kW	3.0	4.4	8.7
• Coefficient of performance A-7W35	COP	3.4	3.3	3.3
Performance data (cooling) in acc. with EN 14511				
• Nominal heat output A35W18	kW	5.0	7.8	12.0
• Energy efficiency ratio A35W18	EER	4.8	4.3	4.4
• Nominal heat output A35W7	kW	3.8	5.4	8.5
• Energy efficiency ratio A35W7	EER	3.7	3.1	3.4
Sound data				
• Max. sound power level outdoor unit, night operation	dB(A)	42	46	53
• Sound power level EN 12102 indoor unit	dB(A)	42	46	45
• Sound power level EN 12102 outdoor unit [3)]	dB(A)	46	50	57
• Max. sound power level outdoor unit	dB(A)	49	53	62
• Sound pressure level 5 m [3), 4)]	dB(A)	27	31	38
• Sound pressure level 10 m [3), 4)]	dB(A)	21	25	32
Hydraulic data				
• Max. flow temperature (without/with screw-in electrical heating inset)	°C	62/65	62/65	62/65
• Max. heating water quantity heating ΔT 5 K (A7W35)	m^3/h	1.5	2.2	3.7
• Nominal heating water quantity heating ΔT 5 K (A7W35)	m^3/h	0.8	1.2	2.2
• Pressure drop with nominal heating water quantity ΔT 5 K (A7W35)	kPa	9	9	38
• Residual overpressure of heating pump at max. pump speed and nominal heating water quantity	kPa	65	66	37
• Max. operating pressure on the heating side	bar	3	3	3
• Max. operating pressure domestic hot water side UltraSource® B compact C	bar	10	10	-
• Flow/return connection heating	R	1″	1″	1″
• Cold/hot water connection UltraSource® B compact C	R	¾″	¾″	-
• Nominal air volume outdoor unit (A7W35 and nominal rotation speed)	m^3/h	2500	3600	5000

Type		(8) (8/200)	(11) (11/200)	(17)
Cooling technical data				
• Refrigerant		R410A	R410A	R410A
• Compressor/stages		Inverter/1	Inverter/1	Inverter/1
• Refrigerant filling quantity	kg	3.2	4.1 (up to 6 m)	4.8
• Compressor oil filling quantity	l	0.35/FV50S	0.99/FV50S	1/FVC68D
• Refrigerant line connections suction gas side	mm	12 x 1	16 x 1	18 x 1
• Refrigerant line connections suction gas side	inches	½″	⅝″	¾″
• Refrigerant line connections liquid side	mm	10 x 1	12 x 1	12 x 1
• Refrigerant line connections liquid side	inches	⅜″	½″	½″
• Max. refrigerant connection line length (metric)	m	16	16	16
• Max. refrigerant connection line length (inch)	m	20	20	20
• Max. difference in height [5]	m	10	10	10
Electrical data				
• Electrical connection compressor	V/Hz	1~230/50	3~400/50	3~400/50
• Electrical connection electric heating element	V/Hz	1~230/50 3~400/50	3~400/50	3~400/50
• Control electrical connection	V/Hz	1~230/50	1~230/50	1~230/50
• Max. compressor operating current	A	15.8	9	14.8
• Max. compressor starting current	A	15.8	9	14.8
• Max. fan operating current	A	0.21	0.5	0.5
• Max. fan power consumption	W	48	113	113
• Max. electric heating element operating current	A	13	13	13
• Max. output for electric heating element	kW	6	6	6
• Output factor		0.94	0.97	0.95
• Main current fuse	A	16	13	16
- Type		C,K	C,K	C,K
• Control current fuse	A	13	13	13
- Type		B,Z	B,Z	B,Z
• Fuse electric heating element	A	13	13	13
- Type		B,Z	B,Z	B,Z
Dimensions/weight of outdoor unit				
• Dimensions (H x W x D)	mm	1200x1090x745		1546x1090x745
• Weight	kg	144	144	177
Dimensions/weight of indoor unit				
• Dimensions (H x W x D)	mm	see Dimensions		
• Tilting measure UltraSource® B compact C	mm	2097	2097	-
• Weight UltraSource® B comfort C	kg	185	209	211
• Weight UltraSource® B compact C	kg	282	305	-
• Minimum sizes of installation room [6]	m^3	7.3	9.3	10.9
Hot water storage tank UltraSource® B compact C				
• Storage capacity	l	210	210	-
• Heating surface of heating coil [7]	m^2	2.4	2.4	-
• Heating water of heating coil [7]	dm^3	19	19	-
• Maximum storage tank temperature	°C	55	55	-
• Maximum storage tank temperature with electric heating element	°C	75	75	-
• Output capacity at 46 °C and storage tank temperature at 58 °C [8]	l	260	260	-
• Output capacity at 40 °C and storage tank temperature at 58 °C [8]	l	315	315	-

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

[2] 4 % can be added for class IV heat pump incl. control and room thermostat.

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

[4] 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.

[5] Oil lifting bends must be installed according to specifications (see engineering notices)

[6] If the installation room is smaller than the required minimum size, it must be designed as a machine room in accordance with EN 378.

[7] Storage capacity incl. heating coil

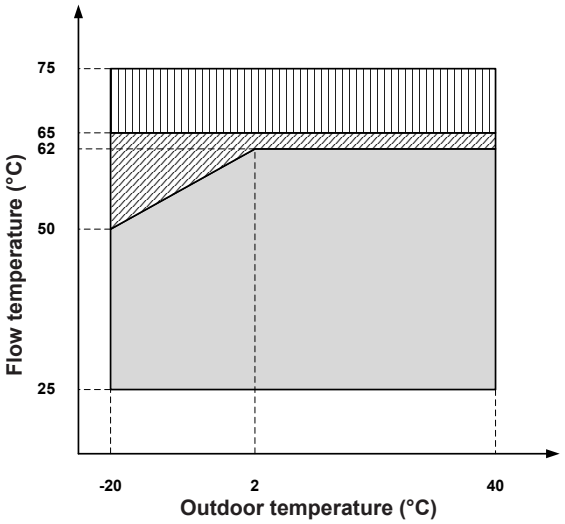
[8] 12 °C cold water temperature/60 °C lower storage tank temperature (heat pump)

Using a fault-current circuit breaker RCCB type B, IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

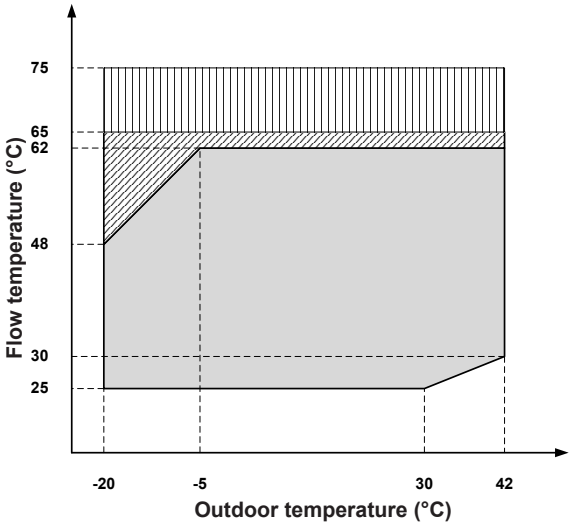
Diagrams of areas of application

Heating and hot water

UltraSource® B comfort C (8)
UltraSource® B compact C (8/200)



UltraSource® B comfort C (11)
UltraSource® B compact C (11/200)
UltraSource® B comfort C (17)



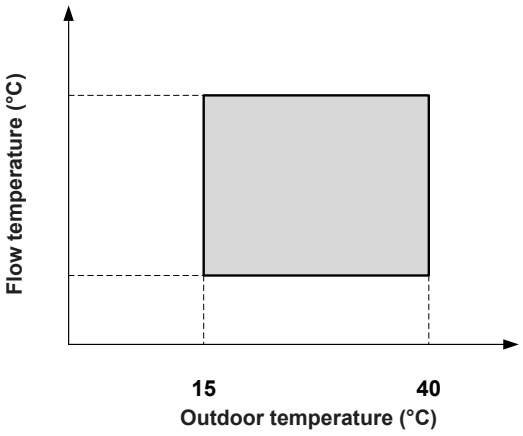
Area of application of the heat pump for heating/domestic hot water (UltraSource® B comfort C and compact C)

Extended area of application of the heat pump for heating/domestic hot water including electric heating element (UltraSource® B comfort C and compact C)

Extended area of application of the heat pump for domestic hot water including electric heating element (UltraSource® B comfort C and compact C)

Cooling

UltraSource® B comfort C (8)
UltraSource® B compact C (8/200)
UltraSource® B comfort C (11,17)
UltraSource® B compact C (11/200)



Area of application of the heat pump for cooling (UltraSource® B comfort C and compact C)

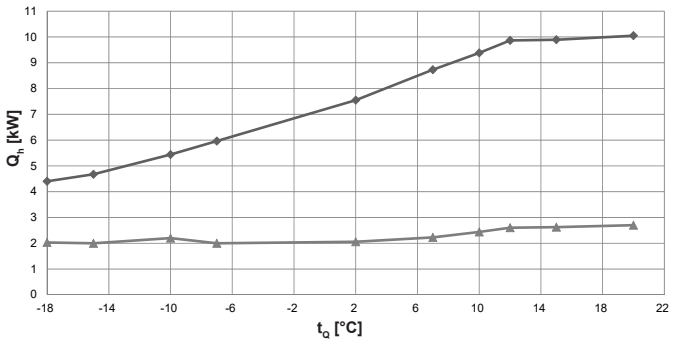
Performance data – heating

Maximum heat output allowing for defrosting losses

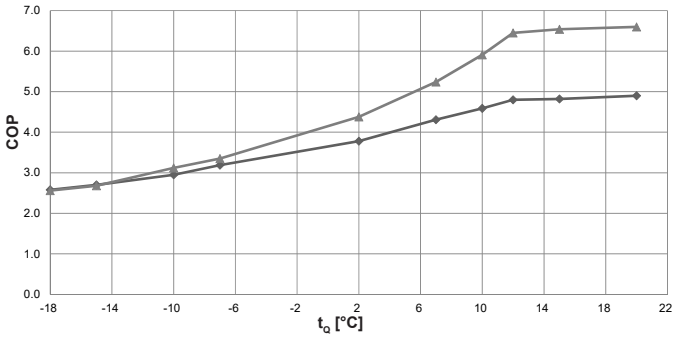
UltraSource® B comfort C (8), compact C (8/200)

Data according to EN 14511

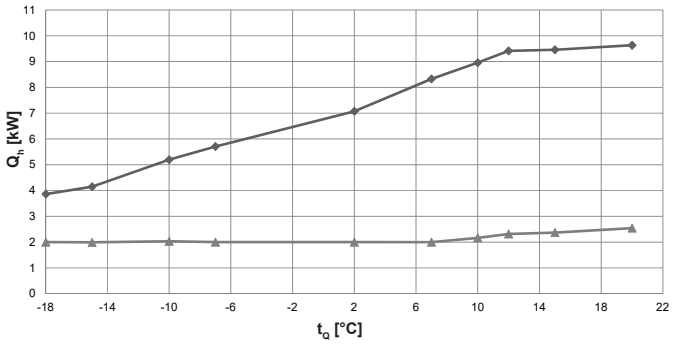
Heat output - t_{VL} 35 °C



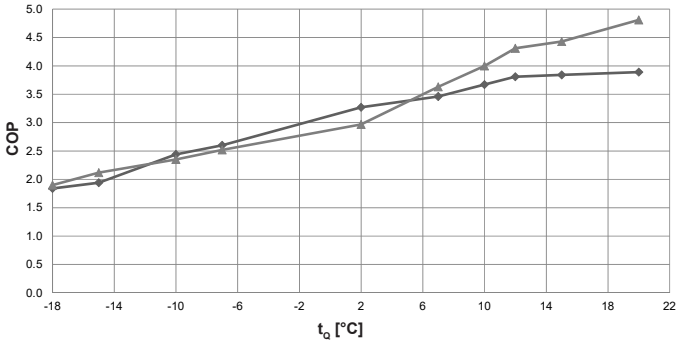
Coefficient of performance - t_{VL} 35 °C



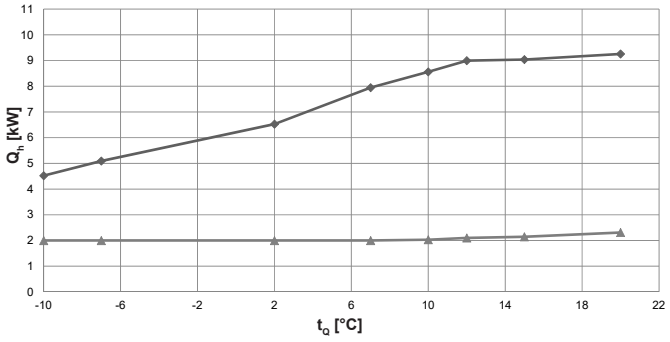
Heat output - t_{VL} 45 °C



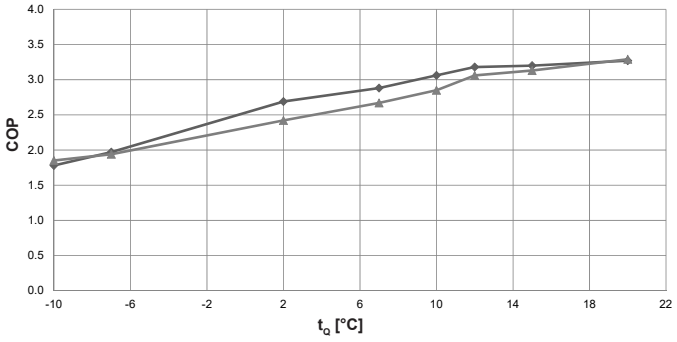
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



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

UltraSource® B comfort C (8), compact C (8/200)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-18	4.4	1.7	2.6	2.0	0.8	2.6
	-15	4.7	1.7	2.7	2.0	0.8	2.7
	-10	5.4	1.8	3.0	2.2	0.7	3.1
	-7	6.0	1.9	3.2	2.0	0.6	3.4
	2	7.6	2.0	3.8	2.1	0.5	4.4
	7	8.7	2.0	4.3	2.2	0.4	5.2
	10	9.4	2.0	4.6	2.4	0.4	5.9
	12	9.9	2.1	4.8	2.6	0.4	6.5
	15	9.9	2.1	4.8	2.6	0.4	6.5
	20	10.1	2.1	4.9	2.7	0.4	6.6
45	-18	3.9	2.1	1.8	2.0	1.1	1.9
	-15	4.2	2.1	1.9	2.0	0.9	2.1
	-10	5.2	2.1	2.4	2.0	0.9	2.4
	-7	5.7	2.2	2.6	2.0	0.8	2.5
	2	7.1	2.2	3.3	2.0	0.7	3.0
	7	8.3	2.4	3.5	2.0	0.6	3.6
	10	9.0	2.4	3.7	2.2	0.5	4.0
	12	9.4	2.5	3.8	2.3	0.5	4.3
	15	9.5	2.5	3.8	2.4	0.5	4.4
	20	9.6	2.5	3.9	2.5	0.5	4.8
50	-18	2.9	2.3	1.3	2.0	1.3	1.6
	-15	3.4	2.3	1.5	2.0	1.2	1.7
	-10	4.7	2.3	2.0	2.1	1.0	2.1
	-7	5.3	2.4	2.2	2.0	0.9	2.2
	2	6.8	2.3	2.9	2.0	0.7	2.8
	7	8.2	2.6	3.1	2.1	0.7	2.9
	10	8.8	2.6	3.4	2.1	0.6	3.4
	12	9.2	2.6	3.5	2.2	0.6	3.6
	15	9.2	2.6	3.5	2.3	0.6	3.7
	20	9.5	2.6	3.6	2.4	0.6	3.8
55	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	4.5	2.5	1.8	2.0	1.1	1.9
	-7	5.1	2.6	2.0	2.0	1.0	1.9
	2	6.5	2.4	2.7	2.0	0.8	2.4
	7	8.0	2.8	2.9	2.0	0.8	2.7
	10	8.6	2.8	3.1	2.0	0.7	2.9
	12	9.0	2.8	3.2	2.1	0.7	3.1
	15	9.0	2.8	3.2	2.2	0.7	3.1
	20	9.3	2.8	3.3	2.3	0.7	3.3
60 (92 %)	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	-	-	-	-	-	-
	-7	-	-	-	-	-	-
	2	6.1	2.4	2.5	1.9	0.8	2.3
	7	7.8	3.0	2.6	2.0	0.9	2.3
	10	8.4	3.0	2.8	2.0	0.8	2.6
	12	8.6	3.0	2.9	2.0	0.8	2.7
	15	8.6	3.0	2.9	2.1	0.8	2.8
	20	9.1	3.0	3.0	2.3	0.8	3.0

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”

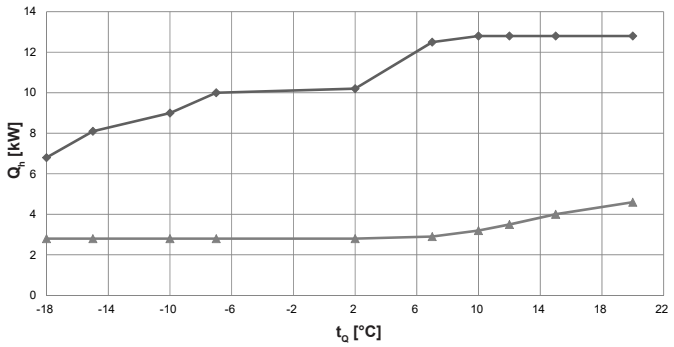
Performance data – heating

Maximum heat output allowing for defrosting losses

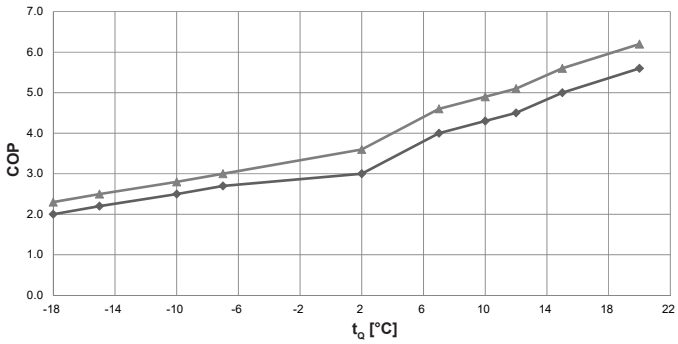
UltraSource® B comfort C (11), compact C (11/200)

Data according to EN 14511

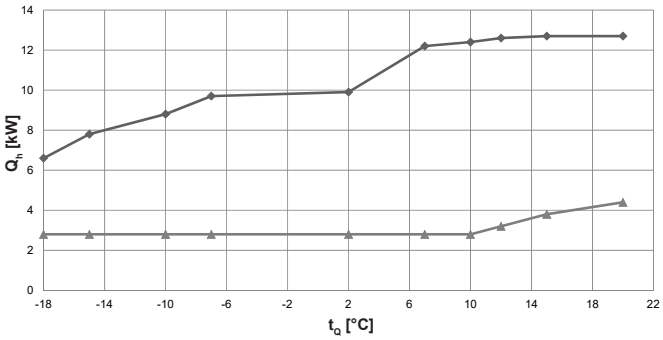
Heat output - t_{VL} 35 °C



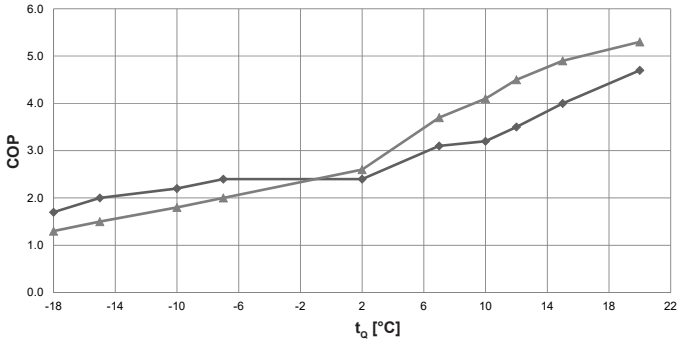
Coefficient of performance - t_{VL} 35 °C



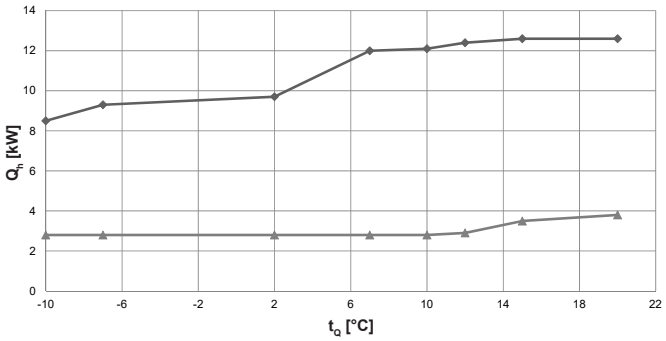
Heat output - t_{VL} 45 °C



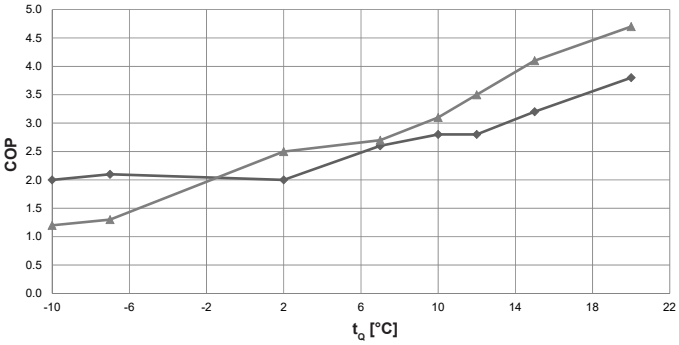
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



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

UltraSource® B comfort C (11), compact C (11/200)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-18	6.8	3.4	2.0	2.8	1.2	2.3
	-15	8.1	3.6	2.2	2.8	1.1	2.5
	-10	9.0	3.6	2.5	2.8	1.0	2.8
	-7	10.0	3.7	2.7	2.8	0.9	3.0
	2	10.2	3.4	3.0	2.8	0.8	3.6
	7	12.5	3.2	4.0	2.9	0.6	4.6
	10	12.8	3.0	4.3	3.2	0.7	4.9
	12	12.8	2.9	4.5	3.5	0.7	5.1
	15	12.8	2.6	5.0	4.0	0.7	5.6
	20	12.8	2.3	5.6	4.6	0.7	6.2
45	-18	6.6	4.0	1.7	2.8	2.2	1.3
	-15	7.8	3.9	2.0	2.8	1.9	1.5
	-10	8.8	4.0	2.2	2.8	1.6	1.8
	-7	9.7	4.1	2.4	2.8	1.4	2.0
	2	9.9	4.1	2.4	2.8	1.1	2.6
	7	12.2	4.0	3.1	2.8	0.8	3.7
	10	12.4	3.8	3.2	2.8	0.7	4.1
	12	12.6	3.6	3.5	3.2	0.7	4.5
	15	12.7	3.2	4.0	3.8	0.8	4.9
	20	12.7	2.7	4.7	4.4	0.8	5.3
50	-18	6.4	4.2	1.5	2.7	2.4	1.1
	-15	7.4	4.2	1.8	2.6	2.0	1.3
	-10	8.6	4.1	2.1	2.8	1.9	1.5
	-7	9.5	4.3	2.2	2.8	1.8	1.6
	2	9.8	4.5	2.2	2.8	1.1	2.6
	7	12.1	4.3	2.8	2.8	0.9	3.1
	10	12.3	4.1	3.0	2.8	0.8	3.5
	12	12.5	4.0	3.1	3.1	0.8	4.0
	15	12.7	3.6	3.5	3.7	0.8	4.5
	20	12.7	3.0	4.2	4.1	0.8	5.0
55	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	8.5	4.2	2.0	2.8	2.3	1.2
	-7	9.3	4.4	2.1	2.8	2.2	1.3
	2	9.7	4.8	2.0	2.8	1.1	2.5
	7	12.0	4.6	2.6	2.8	1.1	2.7
	10	12.1	4.4	2.8	2.8	0.9	3.1
	12	12.4	4.4	2.8	2.9	0.8	3.5
	15	12.6	4.0	3.2	3.5	0.9	4.1
	20	12.6	3.3	3.8	3.8	0.8	4.7
62	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	-	-	-	-	-	-
	-7	-	-	-	-	-	-
	2	9.1	5.8	1.6	2.6	1.3	2.0
	7	11.2	5.6	2.0	2.6	1.3	2.1
	10	11.7	5.4	2.2	2.7	1.1	2.5
	12	11.9	5.4	2.2	2.8	1.0	2.8
	15	12.1	4.7	2.6	3.4	1.0	3.4
	20	12.2	3.9	3.2	3.7	0.9	4.0

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”

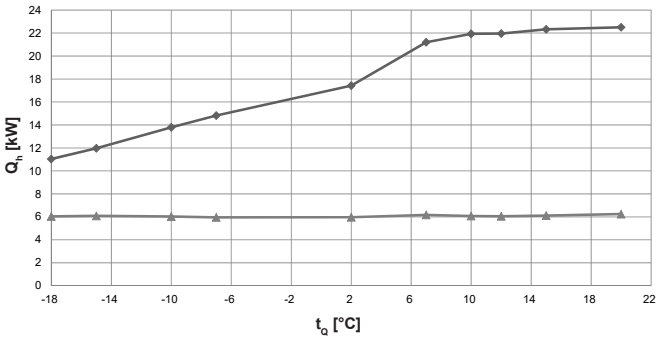
Performance data – heating

Maximum heat output allowing for defrosting losses

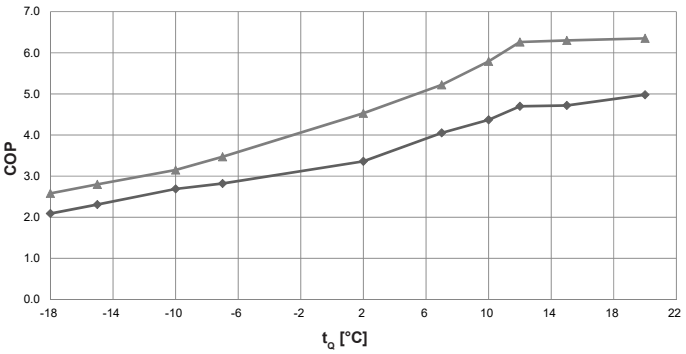
UltraSource® B comfort C (17)

Data according to EN 14511

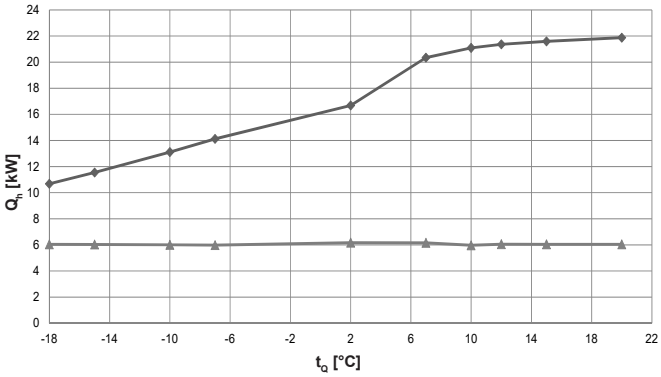
Heat output - t_{VL} 35 °C



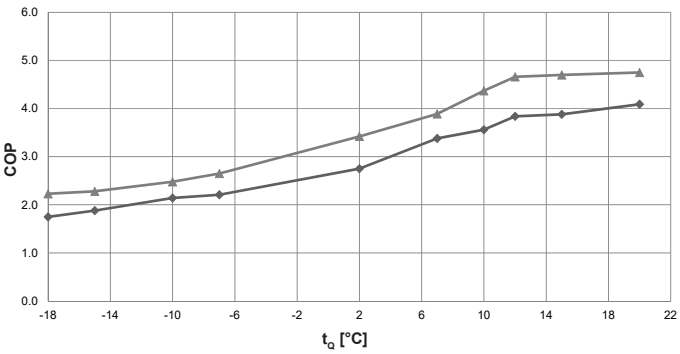
Coefficient of performance - t_{VL} 35 °C



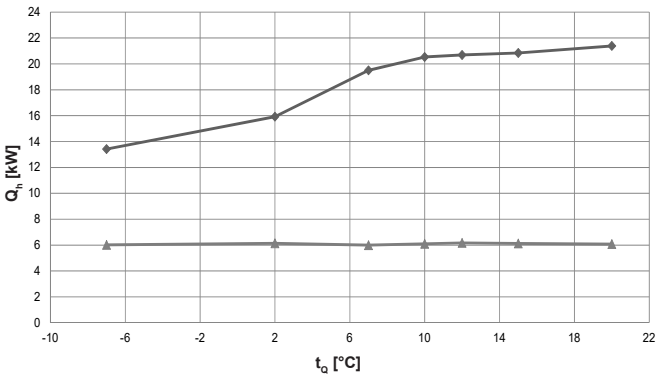
Heat output - t_{VL} 45 °C



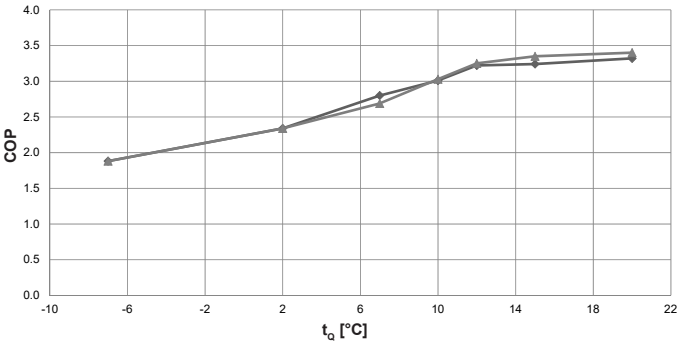
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



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

UltraSource® B comfort C (17)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-18	11.0	5.3	2.1	6.0	2.3	2.6
	-15	12.0	5.2	2.3	6.1	2.2	2.8
	-10	13.8	5.1	2.7	6.0	2.0	3.0
	-7	14.8	5.3	2.8	6.0	1.7	3.5
	2	17.4	5.2	3.4	6.0	1.3	4.5
	7	21.2	5.2	4.1	6.2	1.2	5.2
	10	21.9	5.0	4.4	6.1	1.0	5.8
	12	22.0	4.7	4.7	6.1	1.0	6.3
	15	22.3	4.7	4.7	6.1	1.0	6.3
	20	22.5	4.5	5.0	6.3	1.0	6.4
45	-18	10.7	6.1	1.8	6.0	2.7	2.2
	-15	11.5	6.1	1.9	6.0	2.6	2.3
	-10	13.1	6.1	2.1	6.0	2.4	2.5
	-7	14.1	6.4	2.2	6.0	2.3	2.7
	2	16.7	6.1	2.8	6.2	1.8	3.4
	7	20.4	6.0	3.4	6.2	1.6	3.9
	10	21.1	5.9	3.6	6.0	1.4	4.4
	12	21.4	5.6	3.8	6.1	1.3	4.7
	15	21.6	5.6	3.8	6.0	1.3	4.7
	20	21.9	5.4	4.1	6.0	1.3	4.8
50	-18	10.5	6.7	1.6	6.0	3.3	1.8
	-15	11.3	6.6	1.7	6.1	3.2	1.9
	-10	12.8	6.5	2.0	6.1	3.0	2.0
	-7	13.8	6.7	2.1	6.0	2.8	2.1
	2	16.3	6.4	2.5	6.1	2.3	2.7
	7	19.9	6.6	3.0	6.0	2.0	3.1
	10	20.9	6.4	3.3	6.1	1.8	3.4
	12	21.0	6.0	3.5	6.1	1.7	3.7
	15	21.3	6.0	3.6	6.1	1.6	3.8
	20	21.7	5.9	3.7	6.1	1.6	3.9
55	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	-	-	-	-	-	-
	-7	13.4	7.1	1.9	6.0	3.0	1.9
	2	15.9	6.8	2.3	6.1	2.6	2.3
	7	19.5	7.0	2.8	6.0	2.0	2.7
	10	20.5	6.8	3.0	6.0	2.0	3.0
	12	20.7	6.4	3.2	6.2	2.0	3.3
	15	20.9	6.4	3.2	6.1	1.8	3.4
	20	21.4	6.4	3.3	6.1	1.8	3.4
62 (92 %)	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	-	-	-	-	-	-
	-7	-	-	-	-	-	-
	2	14.9	7.4	2.0	5.8	2.9	2.0
	7	18.7	7.6	2.4	5.8	2.4	2.4
	10	19.8	7.3	2.7	5.9	2.2	2.7
	12	20.0	6.9	2.9	6.0	2.0	3.0
	15	19.9	6.9	2.9	5.8	2.0	2.9
	20	20.4	6.9	2.9	5.8	1.9	2.9

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

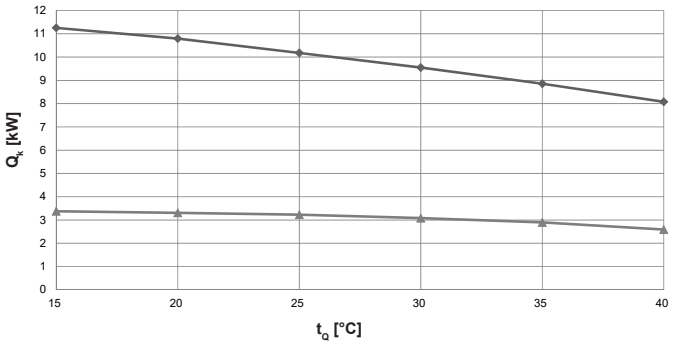
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

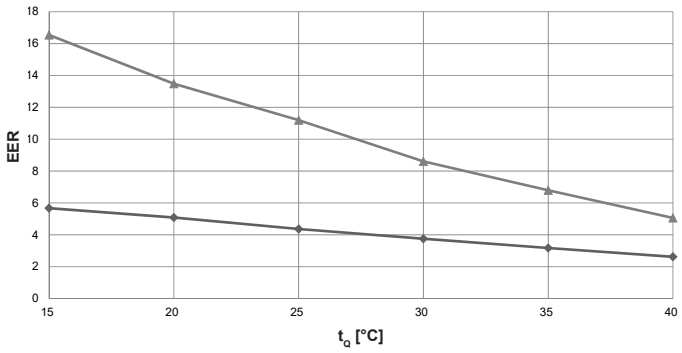
Maximum cooling capacity

UltraSource® B comfort C (8), compact C (8/200)

Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



Maximum output
Minimum output

UltraSource® B comfort C (8), compact C (8/200)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15	8.1	1.7	4.8	2.4	0.2	10.1
	20	7.7	1.9	4.1	2.2	0.3	7.5
	25	7.3	2.1	3.5	2.1	0.4	5.9
	30	6.8	2.3	3.0	2.1	0.5	4.4
	35	6.3	2.4	2.6	2.0	0.5	3.8
	40	5.8	2.7	2.2	2.0	0.7	3.1
12	15	9.7	1.8	5.3	2.8	0.2	13.6
	20	9.2	2.0	4.6	2.8	0.3	10.6
	25	8.7	2.2	4.0	2.6	0.3	8.1
	30	8.0	2.4	3.4	2.5	0.4	6.4
	35	7.5	2.6	2.9	2.3	0.5	5.1
	40	6.8	2.8	2.4	2.2	0.6	3.9
18	15	11.3	2.0	5.7	3.4	0.2	16.5
	20	10.8	2.1	5.1	3.3	0.3	13.5
	25	10.2	2.3	4.4	3.2	0.3	11.2
	30	9.6	2.6	3.8	3.1	0.4	8.1
	35	8.9	2.8	3.2	2.9	0.4	6.8
	40	8.1	3.1	2.6	2.6	0.5	5.1

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

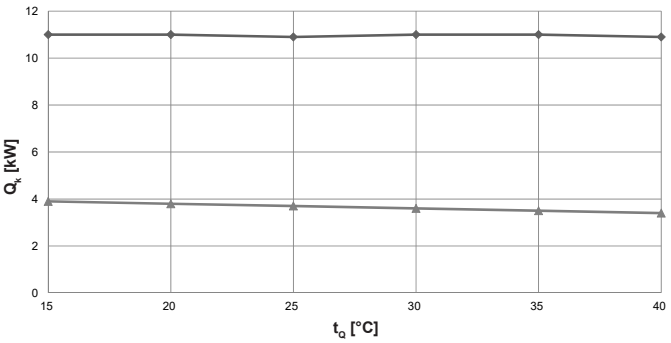
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

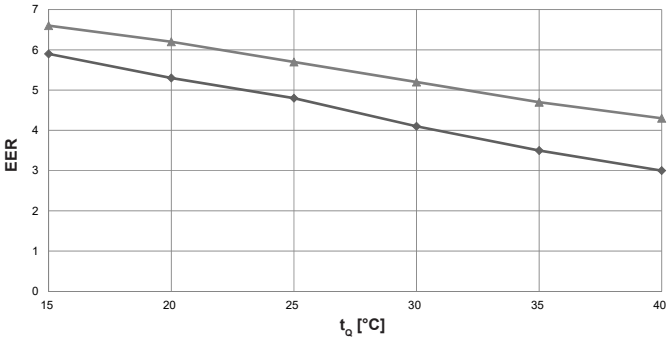
Maximum cooling capacity

UltraSource® B comfort C (11), compact C (11/200)

Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



Maximum output
Minimum output

UltraSource® B comfort C (11), compact C (11/200)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15	11.2	2.4	4.7	2.9	0.6	4.5
	20	10.5	2.5	4.3	2.9	0.7	4.1
	25	9.9	2.6	3.8	3.0	0.8	3.6
	30	9.3	2.8	3.3	3.0	0.9	3.2
	35	8.6	3.0	2.8	2.9	1.1	2.8
	40	8.0	3.4	2.6	2.9	1.2	2.3
12	15	10.8	2.1	5.2	3.1	0.6	5.4
	20	10.9	2.3	4.6	3.0	0.6	5.0
	25	10.8	2.7	4.0	2.9	0.7	4.5
	30	10.8	3.2	3.4	2.8	0.7	4.0
	35	10.1	3.4	3.0	2.9	0.8	3.6
	40	9.5	3.8	2.5	2.9	0.9	3.1
18	15	11.0	1.9	5.9	3.9	0.6	6.6
	20	11.0	2.1	5.3	3.8	0.6	6.2
	25	10.9	2.3	4.8	3.7	0.7	5.7
	30	11.0	2.7	4.1	3.6	0.7	5.2
	35	11.0	3.2	3.5	3.5	0.7	4.7
	40	10.9	3.6	3.0	3.4	0.8	4.3

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

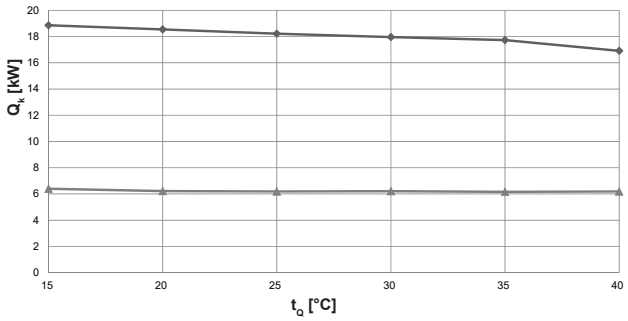
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

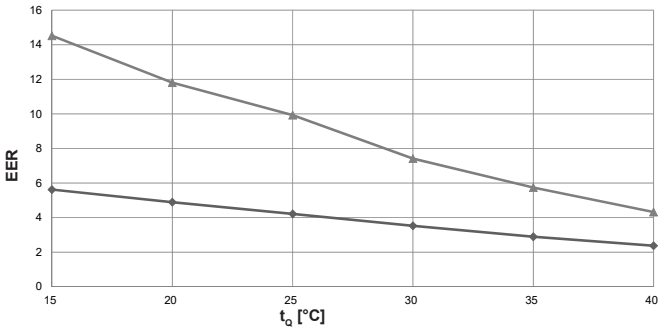
Maximum cooling capacity

UltraSource® B comfort C (17)

Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



Maximum output
Minimum output

UltraSource® B comfort C (17)

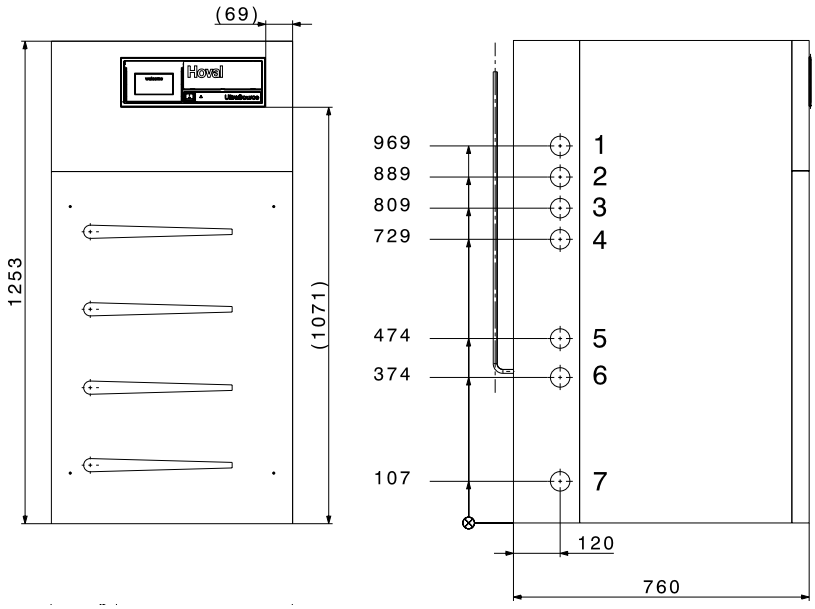
Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15	16.5	3.9	4.2	6.2	0.7	8.5
	20	16.2	4.6	3.5	6.2	0.9	7.0
	25	15.5	5.3	2.9	6.2	1.1	5.7
	30	14.9	6.2	2.4	6.1	1.3	4.7
	35	14.2	7.7	1.9	6.1	1.6	3.8
	40	13.5	9.0	1.5	6.0	1.9	3.1
12	15	18.2	3.7	5.0	6.3	0.5	11.7
	20	17.9	4.3	4.2	6.1	0.7	9.2
	25	17.2	5.0	3.5	6.1	0.8	7.3
	30	16.4	5.8	2.8	6.2	1.1	5.6
	35	15.5	7.1	2.2	6.1	1.4	4.4
	40	14.7	8.2	1.8	6.1	1.7	3.6
18	15	18.9	3.4	5.6	6.4	0.4	14.5
	20	18.5	3.8	4.9	6.2	0.5	11.8
	25	18.2	4.3	4.2	6.2	0.6	9.9
	30	18.0	5.1	3.5	6.2	0.8	7.4
	35	17.7	6.1	2.9	6.2	1.1	5.7
	40	16.9	7.1	2.4	6.2	1.4	4.3

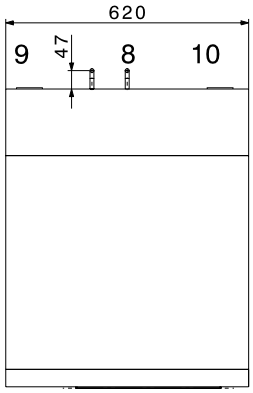
t_{VL} = cooling water flow temperature (°C)
t_Q = source temperature (°C)
Q_k = cooling capacity (kW), measured in accordance with standard EN 14511
P = power consumption, overall unit (kW)
EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

Observe daily power interruptions!
see “Engineering heat pumps general”

UltraSource® B comfort C (8-17)
Indoor unit
(Dimensions in mm)



View from above

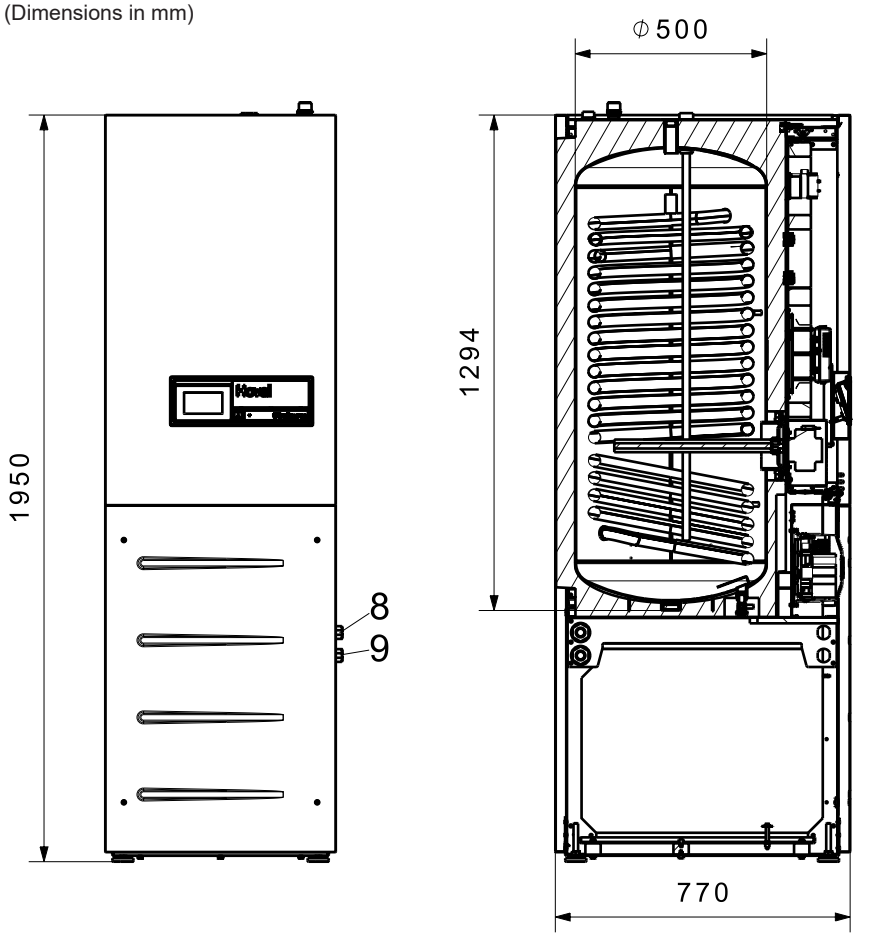


Connections (1-7) optionally on the left or right

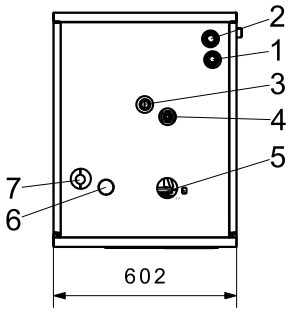
1 Free
2 Flow heating 1″
3 Flow hot water charging 1″
4 Free
5 Free
6 Free
7 Return heating 1″
8 Refrigerant connection lines
9 Cable feed-in main current
10 Cable feed-in sensors

The indoor unit must be accessible from above.

UltraSource® B compact C (8,11/200)
Indoor unit with calorifier
(Dimensions in mm)



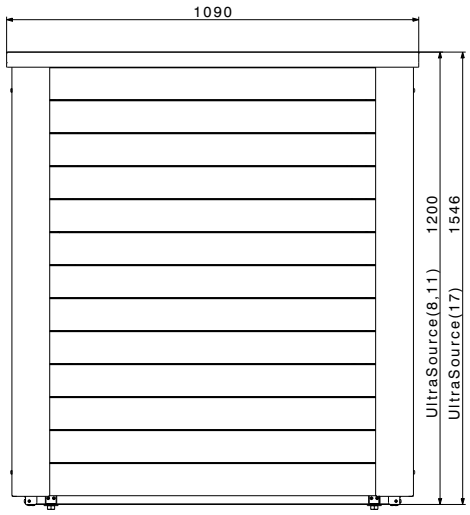
View from above



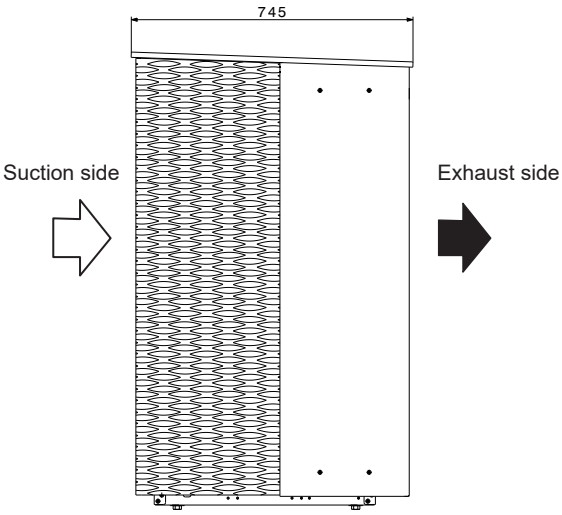
1 Flow heating 1″
2 Return heating 1″
3 Hot water connection ¾″
4 Cold water connection ¾″
5 Cable feed-in sensors
6 Circulation connection ¾″
7 Cable feed-in main current
8 Refrigerant connection line
9 Refrigerant connection line

UltraSource® B
Outdoor unit
(Dimensions in mm)

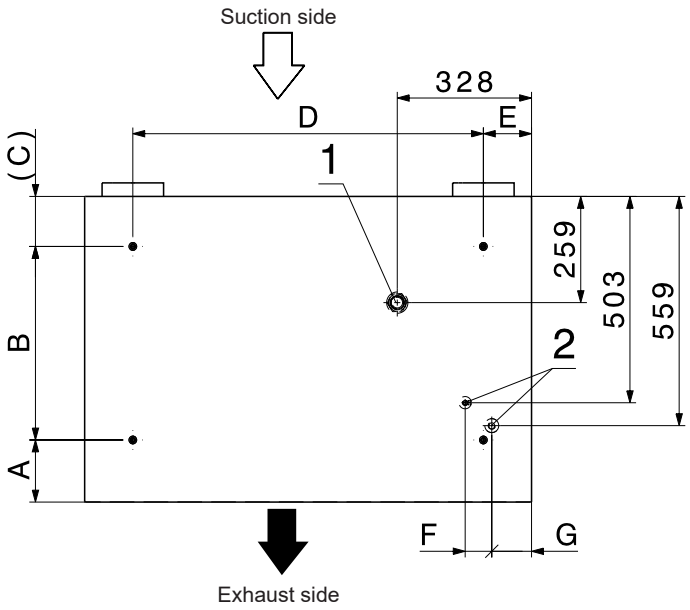
Front view



View from left



View from above

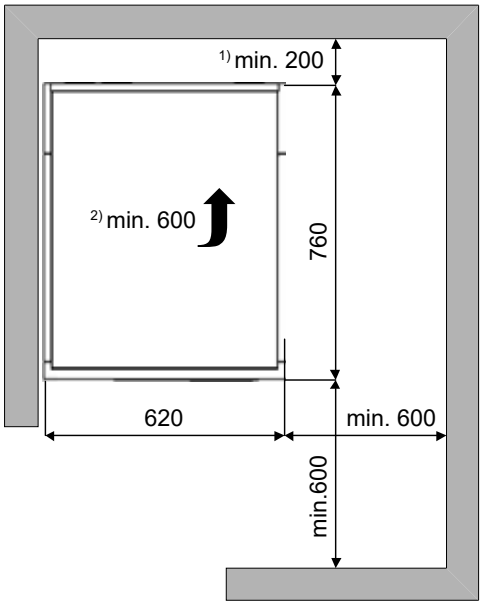


1 Condensate drain (Rp 1″)
2 Refrigerant connection line connections Ø 10,12,16 or 18

Type	A	B	C	D	E	F	G
(8)	160	460	125	960	65	44	196
(11)	160	460	125	960	65	44	196
(17)	151	472	122	855	118	65	97

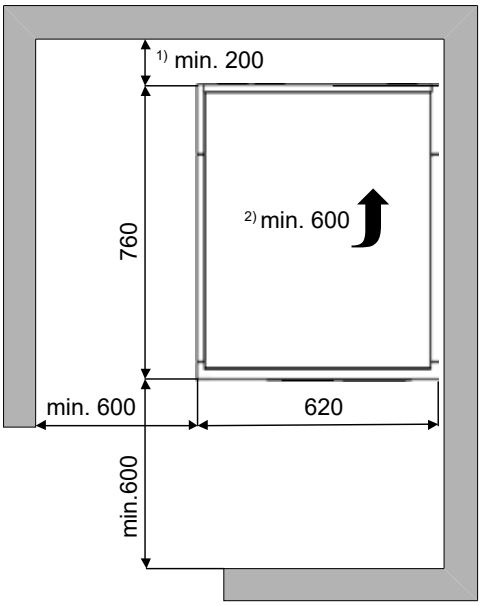
Space requirement
(Dimensions in mm)

UltraSource® B comfort C (8-17) left
Indoor unit



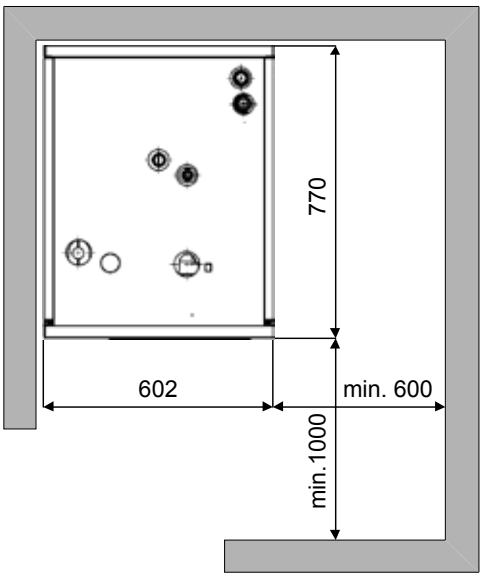
1) A gap of at least 200 mm must be guaranteed at the rear for the refrigerant as well as electrical connection.

UltraSource® B comfort C (8-17) right
Indoor unit



2) To ensure accessibility to the electrical connections, a clearance of at least 600 mm must be provided above the UltraSource® B comfort C (8-17)!

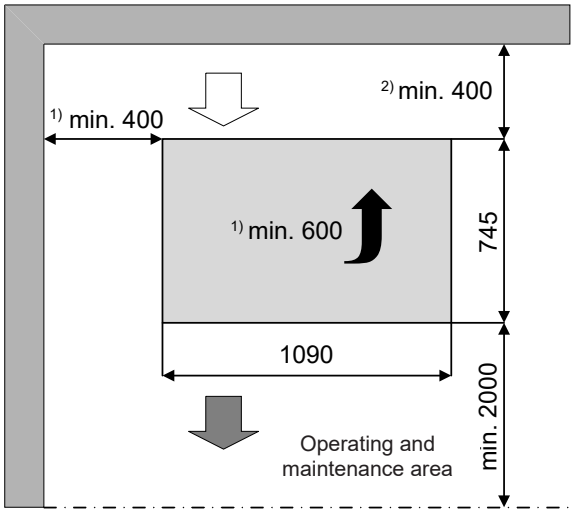
UltraSource® B compact C (8,11/200)
Indoor unit



Due to the need for access to the 3-way switching ball valve for heating and domestic hot water, a gap of at least 600 mm must be guaranteed on the right side.

UltraSource® B
Outdoor unit

View from above

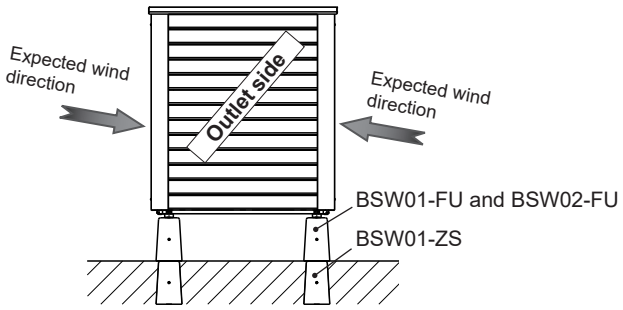


1) Due to the need for access during maintenance, a gap of 400 mm must be guaranteed on both sides and 600 mm above.
2) If the air intake grille can not be lifted upwards, there must be a gap of min. 600 mm on the suction side.

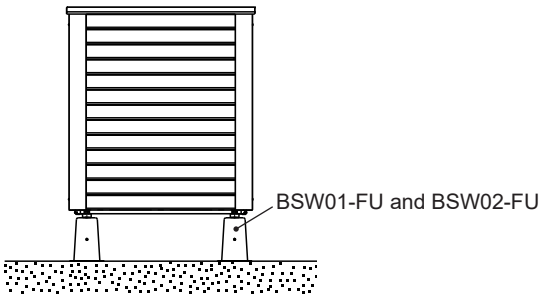
Installation variants UltraSource® B outdoor unit

(Dimensions in mm)

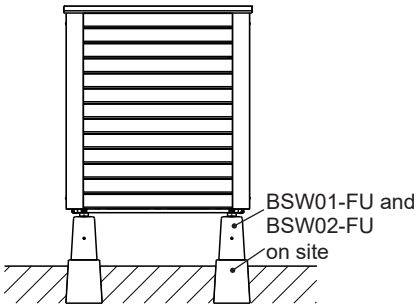
Firm base with Hoval concrete base set

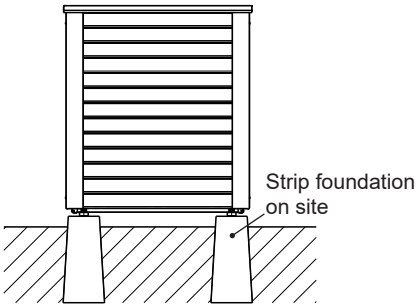


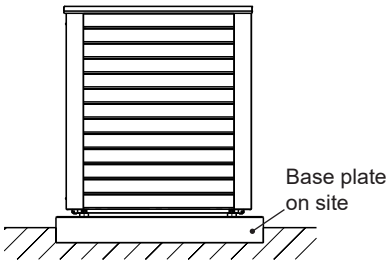
Flat roof or existing firm base



Firm base on site

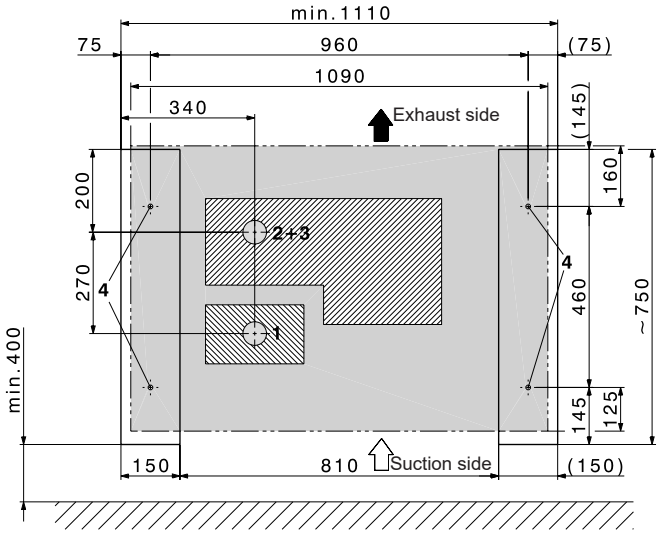




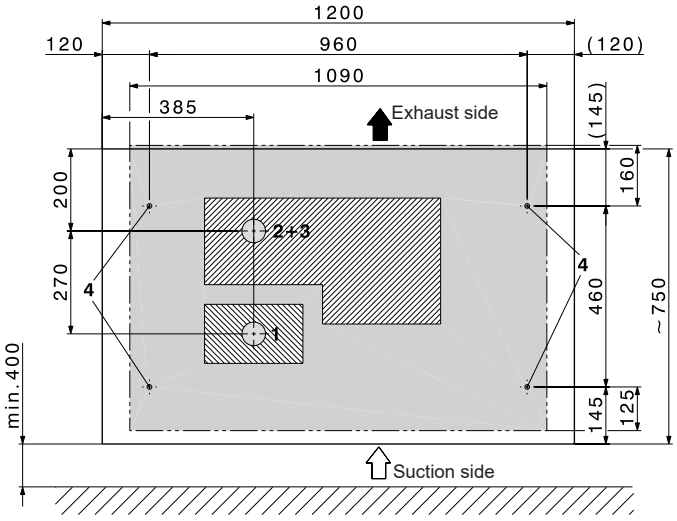


UltraSource® B comfort C (8,11)
UltraSource® B compact C (8,200), (11/200)

Strip foundation
Plan concrete base set
(view from top)

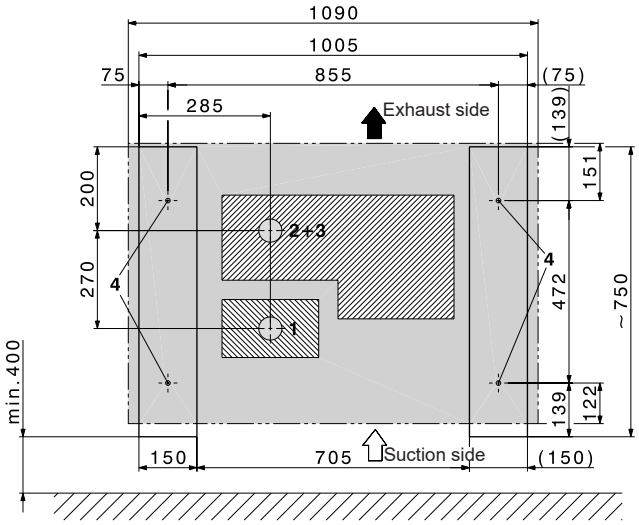


Strip foundation
Plan concrete base set
(view from top)

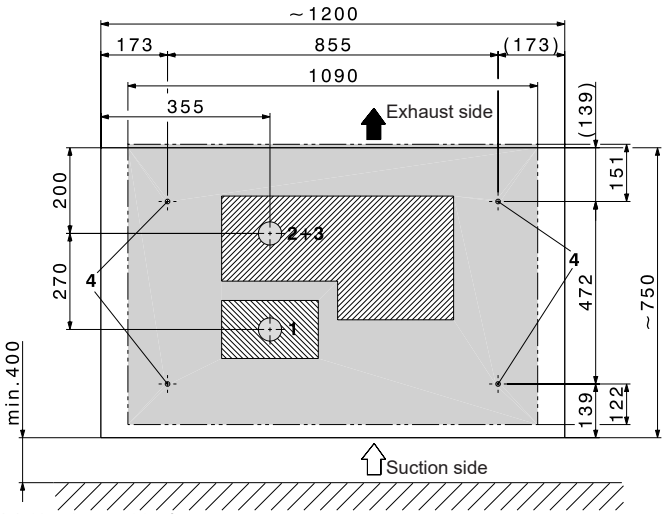


UltraSource® B comfort C (17)

Strip foundation
Plan concrete base set
(view from top)



Strip foundation
Plan concrete base set
(view from top)

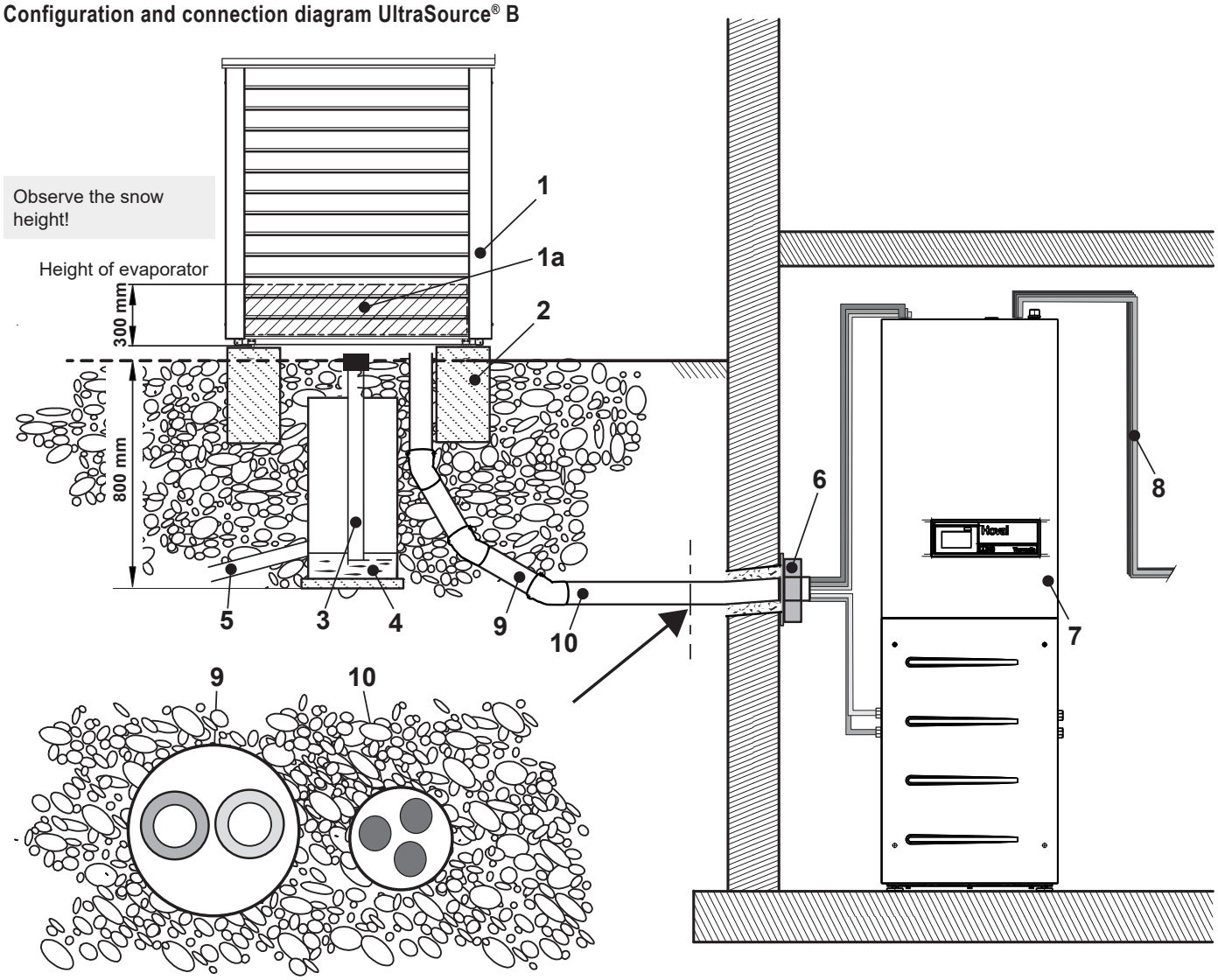


1 Optimum position for condensate drain DN 100
Upper edge of condensate drain 50-100 mm above floor level
Alternative: without drain. Infiltration of the condensate into the ground.
2 Optimum position of empty tube DN 150 for refrigerant connection lines
Upper edge of empty tube 50-100 mm above strip foundation level
3 Optimum position for empty tube for electrical cables
4 Attachment points 4 x M12

Possible area for empty piping in the concrete base

Possible area for co ate drain in the concrete base

Configuration and connection diagram UltraSource® B



1 UltraSource® outdoor unit
1a Space for connection of refrigerant connection lines, condensate drain etc.
2 Concrete base
3 Condensate drain (Rp 1″)
4 Possible variant with duct/gravel layer
5 Discharge into the sewer system
6 Wall lead-through (hydraulic and electrical connections)
7 UltraSource® indoor unit
8 Main current

for (8):	1 x 230 V/50 Hz
for (11,17):	3 x 400 V/50 Hz
Control current	1 x 230 V/50 Hz
Main current immersion heater	
for (8):	1 x 230 V/50 Hz (3 kW) or 3 x 400 V/50 Hz (6 kW)
for (11,17):	3 x 400 V/50 Hz (6 kW)

Network cables (optional)

9 Plain tube for refrigerant connection lines

	(8)	(11)	(17)
Suction gas line [mm]:	12 x 1	16 x 1	18 x 1
Suction gas line [inches]:	½″	⅝″	¾″
Liquid line [mm]:	10 x 1	12 x 1	12 x 1
Liquid line [inches]:	⅜″	½″	½″
Max. refrigerant connection line length (metric) [m]:	16	16	16
Max. refrigerant connection line length (inches) [m]:	20	20	20

10 Empty tube for electrical connections for outdoor unit

Control current outdoor unit	1 x 230 V/50 Hz
Trace heating tape	1 x 230 V/50 Hz
Data bus RS485	

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 refrigerant connection lines guarantees cost effectiveness.
- The maximum permissible length of the lines between the outdoor and indoor unit is 16 m (metric) or 20 m (inches) and must not be exceeded.
- The maximum height difference between the outdoor and indoor unit is 10 m and must not be exceeded either.
- If the height difference between the indoor and outdoor unit is more than 5 m, an oil lifting bend must be installed in the suction gas line before the slope. If the height difference is greater, this measure must also be taken every 5 m (see assembly instructions).
  The oil lifting bends must be installed by a specialist refrigeration engineer. It does not matter whether the indoor or the outdoor unit is higher.
- For efficiency reasons, the line length with the UltraSource® B comfort C between the calorifier and the indoor unit is not allowed to be more than 10 m.

Indoor unit
- The installation location must be selected in accordance with the valid requirements and directives. In particular, EN 378 Parts 1 and 2 as well as BGR 500 must be complied with.
- 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.
- If the installation room is smaller than the required minimum size, it must be designed as a machine room in accordance with the provisions of EN 378.
- Installation in wet rooms, dusty rooms or rooms with a potentially explosive atmosphere is not permitted.
- To minimise vibration and noise inside the building, heat pumps should be isolated as well as possible from the building structure. For example heat pumps should never be installed on lightweight ceilings/floor. In the case of floating screed, a recess should be cut in the screed and the impact sound insulation around the heat pump.
- The connections for the refrigerant lines in the UltraSource® B comfort C are on the back and in the UltraSource® B compact C are either on the right or left of the heat pump.
- The connections for the heating flow and return in the UltraSource® B comfort C are on either the left or right and in the UltraSource® B compact C they are on the top.
- The connections for hot and cold water as well as for the hot water circulation are also located on top in the UltraSource® B compact C.
- A gap of at least 600 mm must be observed for maintenance work on the front and, depending on where the refrigerant connection lines are connected, on the right or left side of the heat pump (see dimensions/space required). On the front of the UltraSource® B compact C, the minimum distance to be maintained is 1000 mm.
- 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.

It is imperative that a system water protection filter is installed in the heating return upstream from the heat pump.

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:
- Maximum line length, see set-up.
- Maximum height difference between the indoor and outdoor units, see set-up.
- 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.
- A frost-proof connection of the condensate drain is required.
- 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 machine is installed at wind-prone locations (e.g. on the roof), the alignment of the machine must be selected in such a way that the expected wind direction is normal 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 in any case.
- The outdoor unit must always be installed on a solid surface in a horizontal position. This can be achieved by means of specially installed concrete bases.
- The load-bearing capability must be adequate. The unit must be fixed there four times with M10 screws.
- Air heat pumps generate condensate during operation. This can be up to 6 litres per defrost cycle within 2 minutes for the outdoor unit of the UltraSource®.
- The condensate collection tank 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.

Flat roof installation
Flat roof installation of the UltraSource® B is possible under the following conditions:
- 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 border: 1.5 m.
- 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.
- 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).

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 dimensions 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 pumps.
- This fault-current circuit breaker must be of the all-current-sensitive type B (IΔN ≥ 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 connecting and feeder lines must be copper cables.
- Please refer to the wiring diagram for electrical details.
- Wall lead-through, protective pipe for routing of the lines

- 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.
- Earthing of the outdoor unit

Routing of refrigerant connection lines

- If the refrigerant 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. Only 15° bends are to be used for empty pipe installation (no 45° and 90° bends).
- The total change of direction of all bends must not exceed 150° (important for routing in the ground)
- Wall ducts slightly tilted to the outside or seal on site
- Empty tube without a change of direction: min. 150 mm
- Routing in the screed (underlay) must be avoided. If there is no other possibility, especial care is important. The installer should route the refrigerant connection line in collaboration with Hoval customer service.
- After the refrigerant connection line has been laid, it must be checked for damage and reinsulated. Condensate can form on the pipes.
- The refrigerant connection lines are only allowed to be connected and refrigerant is only allowed to be handled by authorised personnel of Hoval or by trained specialist personnel.
- The flow of refrigerant in the connection pipes can cause flow noise. The refrigerant connection lines must be laid decoupled from the building and must never be laid flush-mounted.
- Care must be taken to ensure that neither refrigerant nor water pipes pass through the sleeping or living areas.
- The shut-off valves are not allowed to be opened until immediately before commissioning.

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.
- We do not recommend the use of panel heating for room cooling. Various criteria such as temperatures below the dewpoint or the temperature profile 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.

Additional instructions
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 rating 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 should 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.
- 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.
- Ventilation possibilities must be provided at the highest point 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).
- 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).

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

Hoval Belaria® comfort ICM

Modulating air/water heat pump

- Air/water heat pump in compact design for indoor installation.
- Sturdy housing with steel frame. Removable side walls made of power-coated sheet steel with optimum heat and noise insulation. Colour flame red/brown red (RAL 3000/RAL 3011)
- Belaria® comfort ICM (8) with modulating rotary compressor
  Belaria® comfort ICM (13) with modulating scroll enclosed compressor
- With enclosed scroll compressor controlled by inverter
- With large-area, aluminium/copper ribbed pipe evaporator and plate-type condenser made from stainless steel/copper
- Speed-controlled centrifugal fan
- Refrigerant circuit with electronic expansion valve, filter dryer with sight glass, suction-gas heat exchanger, manifold, high and low-pressure pressure controllers
- Efficient defrosting control via reversible refrigeration circuit
- With cooling function with corresponding hydraulics
- Speed-controlled high-efficiency pump installed
- Flow sensor/flow meter or heat meter
- Electric heating element 1 to 6 kW
- Filled with refrigerant R410A, wired up internally ready for connection
- Hydraulic connections removable from left or right, hoses 1″ see accessories
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- The heat pump can be brought in separately. Separation of the heat pump must be performed by a Hovel specialist.
- TopTronic® E controller installed

Model range

Belaria® comfort ICM type	35 °C	55 °C	Heat output [1] A2W35 kW	COP A2W35	Cooling capacity [1] A35W18 kW
(8)	A+++	A++	2.1-6.6	4.3	2.6-8.0
(13)	A+++	A++	3.8-12.7	4.1	6.9-13.9

Energy efficiency class of the compound system with control
[1] Modulation range

Condensate connection
- Discharge pipe must be configured with a sufficient slope and without a change of section

Heat source connections (air intake and air blow-off)
- Air intake from the rear (long side)
- Blow-out opening (can be converted for the air blow-out direction to the side left or right)

Electrical connections
- Connection bottom left or right
- Do not attach any rigid connections (e.g. cable duct) to the heat pump housing

Set-up
- Variable and cost-effective corner installation, air blow-off and hydraulic connection can be selected on the left or right

Options
- Hot water set: drive motor for 3-way switch ball valve with flexible hose 1”, calorifier sensor
- Active cooling mode
- Internet connection
- Weatherproof grille
- Mesh grille
- Wall insulation
- Wall connection elements
- Air hose

Delivery
- One-piece design
- Completely packed

TopTronic® E controller

Control panel
- 4.3-inch colour touchscreen
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

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 heat balancing or
  - Module expansion universal
- 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.

Air/water heat pump

Belaria® comfort ICM type	Heat output [1] A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8)	2.1-6.6	2.6-8.0	7019 150
(13)	3.8-12.7	6.9-13.9	7019 151

[1] Modulation range

Energy efficiency class see description

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

Further information
see “Description”

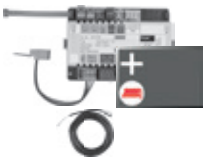
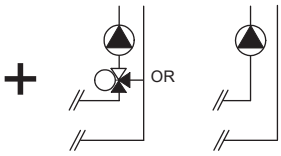
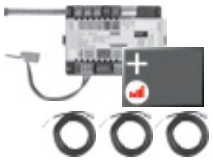
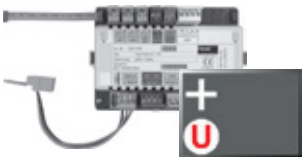
Electric heating elements
see “Calorifiers” - chapter “electric heating elements”

Hose set SPCH25-25-10-2 — 6058 817
for UltraSource® B cf C (8-17) and Belaria® comfort ICM (8)
Consisting of:
- 2 reinforced hoses PN 10 DN 25 1″ IT insulated for heating side flat-sealing with union nut
- Length: 1.0 m
- 2 brackets DN 25
- Seals

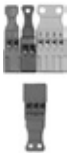
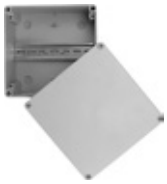
Hose set SPCH25-40-10/15-2 — 6058 818
for Belaria® comfort ICM (13)
Consisting of:
- 1 reinforced hoses PN 10 DN 25 1″ IT insulated for heating side flat-sealing with union nut
- Length: 1.0 m
- 1 reinforced hose PN 10 DN 25 1″ IT insulated for heating side flat-sealing with union nut
- Length: 1.5 m
- 1 bracket set DN 25-DN 32
- Seals

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
 	**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!	6034 576
	**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	6037 062
	**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.	6034 575

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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”

Heating accessories

		Part No.
	Pressure expansion tanks see “Various system components”	
	**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
	**Connection set AS32-2/H** for compact mounting of all required fittings of a direct circuit consisting of: 2 thermometer ball valves Wall bracket included separately Connection T-piece DN 32 in the return flow for connecting the sludge separator CS 32 bottom and the diaphragm pressure expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**Differential pressure relief valve DN 20** for free installation with flexible centre distance Connections at both ends 1″ external thread Operating pressure: max. 10 bar Operating temperature: max. 120 °C Setting range: 0.05-0.5 bar Length: 93 mm Casing made of brass with setting handle made of plastic	240 554
	**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

System water protection filter FGM025-200
For horizontal installation in return
For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop
Consisting of:
- Filter head and bowl in brass
- Magnetic insert (nickel-neodymium)
- 2 pressure gauges
- Very large 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 (Δp < 0.1 bar): 5.5 m³/h
Weight: 6.8 kg
Water temperature: max. 90 °C
- incl. steam diffusion-tight insulating shells

Part No. 6058 256

Notice
Fulfills the function of sludge separator and strainer

Additional sludge separators
see “Various system components”

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

Part No. 2070 911

Vibration decoupler
for reducing structure-borne noise from heat pumps in the indoor area
Consisting of:
- 1 vibration decoupler insulated for heating side flat-sealing with union nut
- 2 flat seals

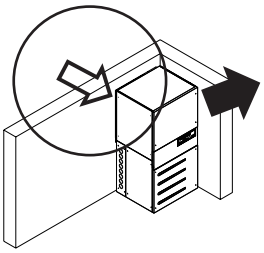
Nominal pressure: PN 10

Dimension	Connection inches	Nominal length mm	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Domestic hot water accessories

		Part No.
	**Domestic hot water set SPW25-25-10-1MD** for UltraSource® B comfort C (8-17), Belaria® comfort ICM (8) and UltraSource® T comfort (8-17) Consisting of: - 1 actuator for installed 3-way switching ball valve for heating/ domestic hot water - 1 reinforced hose PN 10 DN 25 1″ IT insulated for domestic hot water side flat-sealing with union nut - Length: 1.0 m - Seals	6058 815
	**Domestic hot water set SPW25-40-10-1MD** for Belaria® comfort ICM (13) Consisting of: - 1 actuator for installed 3-way switching ball valve for heating/ domestic hot water - 1 reinforced hose PN 10 DN 25 1″ IT insulated for domestic hot water side flat-sealing with union nut - Length: 1.0 m - 1 bracket DN 25-40 - Seals	6058 816

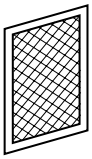
Accessories of the air guide



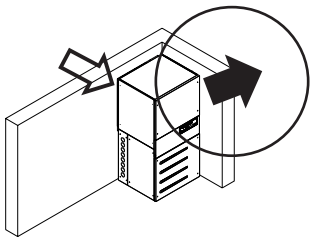
“Standard” indoor installation

Installation directly in the corner

Intake

	Part No.
 **Wall connection element WA-E01 for suction** for Belaria® comfort ICM (8,13) for sealing the suction side directly on the wall black synthetic rubber, 50 mm	6031 891
 **Wall insulation 1250 x 600 x 20** for Belaria® comfort ICM (8,13), for Belaria® twin I/IR (20-30) for suction and exhaust	2076 728
 **Weatherproof grille WG-E01 for suction** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20 for suction, made of aluminium with grilles	6031 935
 **Weatherproof grille WG-E01 sound-insulated** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20 for suction, made of aluminium with grilles Reduction of sound power level 5 dB(A)	2076 720
 **Mesh grille MG-E01 for suction** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20	6031 938

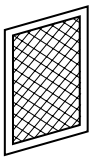
Accessories of the air guide



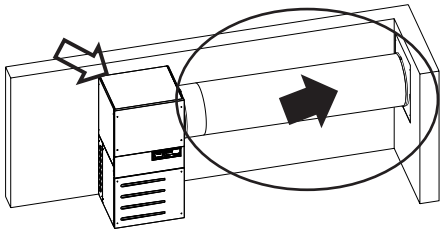
“Standard” indoor installation

Installation directly in the corner

Outlet

		Part No.
	**Wall connection element WA-A01 for exhaust** for Belaria® comfort ICM (8,13) for sealing the exhaust side directly on the wall black synthetic rubber, 50 mm	6031 892
	**Wall insulation 1250 x 600 x 20** for Belaria® comfort ICM (8,13), for Belaria® twin I/IR (20-30) for suction and exhaust	2076 728
	**Weatherproof grille WG-A01 for exhaust** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles	6031 936
	**Weatherproof grille WG-A01 sound-insulated** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles Reduction of sound power level 5 dB(A)	2076 721
	**Mesh grille MG-A01 for exhaust** for Belaria® comfort ICM (8,13) suitable for wall insulation 1250 x 600 x 20	6031 939

Accessories of the air guide



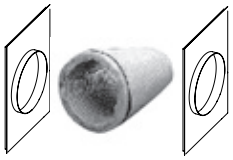
“Flex” indoor installation

“Flex” installation for individual solutions

Intake

see “Standard” installation

Outlet on side via flexible hose



Air hose set LS 560
for Belaria® comfort ICM
Ø 560 mm insulated hose, plastic foil outside.
Insulation mineral wool,
metal spiral inside with plastic foil.
incl. clamps and connection plates;
heat pump and wall side.

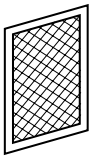
Reduced sound levels (outside) due to the installation situation
The following reductions in the sound levels can be assumed as a result of the installation of the following components in the air duct:
- Light well from a depth of 1.5 m: - 4 dB(A)
- Air hose sound-insulated on inside, L < 2 m: - 4 dB(A)
- Air hose sound-insulated on inside, L > 2 m: - 6 dB(A)

Type	length, can be shortened m	Part No.
560-2	2	6032 045
560-3	3	6032 046
560-5	5	6032 047

Wall insulation 1250 x 600 x 20 — 2076 728
for Belaria® comfort ICM (8,13),
for Belaria® twin I/IR (20-30)
for suction and exhaust

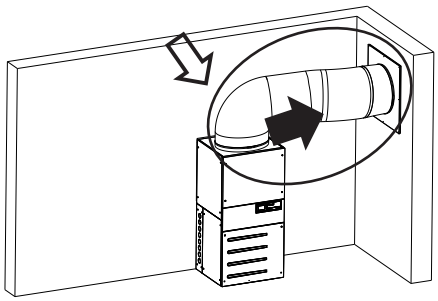
Weatherproof grille WG-A02 for exhaust — 6031 937
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an
air duct
made of aluminium with grilles

Weatherproof grille WG-A02 sound-insulated — 2076 722
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an
air duct
made of aluminium with grilles
Reduction of sound power level 5 dB(A)



Mesh grille MG-A02 for exhaust — 6031 940
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an
air duct
made of aluminium with grilles

Accessories of the air guide



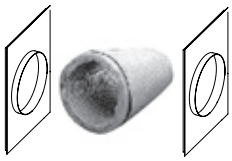
“Flex” indoor installation

“Flex” installation for individual solutions

Intake

see “Standard” installation

Outlet on top via flexible hose



Air hose set LS560-2
for Belaria® comfort ICM
Ø 560 mm insulated hose, plastic foil outside.
Insulation mineral wool,
metal spiral inside with plastic foil.
incl. clamps and connection plates;
heat pump and wall side.

Reduced sound levels (outside) due to the installation situation
The following reductions in the sound levels can be assumed as a result of the installation of the following components in the air duct:
- Light well from a depth of 1.5 m: - 4 dB(A)
- Air hose sound-insulated on inside, L < 2 m: - 4 dB(A)
- Air hose sound-insulated on inside, L > 2 m: - 6 dB(A)

Type	length, can be shortened m	Part No.
560-2	2	6046 564
560-3	3	6046 565
560-5	5	6046 566

Wall insulation 1250 x 600 x 20
for Belaria® comfort ICM (8,13),
for Belaria® twin I/IR (20-30)
for suction and exhaust

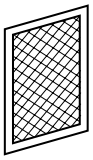
Part No. 2076 728

Weatherproof grille WG-A02 for exhaust
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an air duct
made of aluminium with grilles

Part No. 6031 937

Weatherproof grille WG-A02 sound-insulated
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an air duct
made of aluminium with grilles
Reduction of sound power level 5 dB(A)

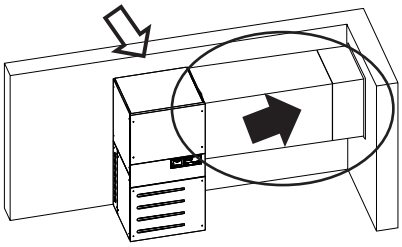
Part No. 2076 722



Mesh grille MG-A02 for exhaust
for Belaria® comfort ICM (8,13)
suitable for wall insulation 1250 x 600 x 20
for exhaust with air hose in an air duct
made of aluminium with grilles

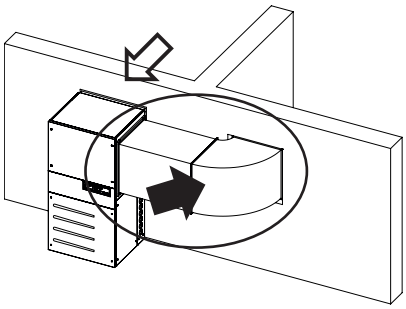
Part No. 6031 940

Accessories of the air guide



“Duct” indoor installation

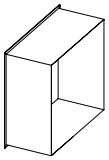
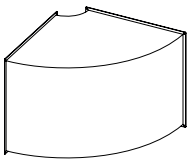
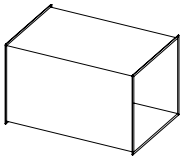
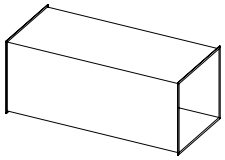
Straight or with elbow

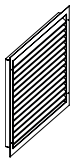
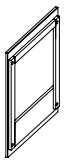


Intake

see “Standard” installation

Blow off to the side via duct

	Part No.
 **Wall fitting MS01** for Belaria® comfort ICM For connection of the air duct LKG 10 or LKG 15 on the wall air duct wall fitting insulated incl. installation material H x W: 680 x 650 mm	6040 349
 **Air duct elbow LKB90 - 90°** for Belaria® comfort ICM air duct 90° insulated incl. installation material H x W: 680 x 650 mm	6040 350
 **Air duct LKG10 - 1.0 m** for Belaria® comfort ICM air duct outlet side insulated, incl. installation material H x W x L: 680 x 650 mm x 1000 mm ducts can be shortened	6040 351
 **Air duct LKG15 - 1.5 m** for Belaria® comfort ICM air duct outlet side insulated, incl. installation material H x W x L: 680 x 650 mm x 1500 mm ducts can be shortened	6040 352
 **Weatherproof grille WG-MS01** for Belaria® comfort ICM Weatherproof grille outlet via air duct Anodized aluminium incl. installation material	6040 363

		Part No.
	**Mesh grille MG-MS01** for Belaria® comfort ICM Mesh grille outlet via air duct Galvanised steel incl. installation material	6040 364
	**Blow-out panel cpl. - duct conn.RAL 3000** for Belaria® comfort ICM For connection of the air duct LKG 10 or LKG 15 to the heat pump	6038 045

Belaria® comfort ICM (8,13)

Type		(8)	(13)
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	181	180
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	130	136
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	4.5/3.3	4.6/3.5
Max./min. performance data heating and cooling in acc. with EN 14511			
• Max. heat output A2W35	kW	6.6	12.7
• Max. heat output A-7W35	kW	6.2	10.9
• Max. heat output A15W35	kW	2.6	5.8
• Max. cooling capacity A35W18	kW	8.0	13.9
• Max. cooling capacity A35W7	kW	6.1	9.8
• Max. cooling capacity A35W18	kW	2.5	6.9
Nominal performance data heating in acc. with EN 14511			
• Nominal heat output A2W35	kW	3.9	7.1
• Coefficient of performance A2W35	COP	4.3	4.1
• Nominal heat output A7W35	kW	4.5	8.3
• Coefficient of performance A7W35	COP	5.1	4.8
• Nominal heat output A-7W35	kW	2.8	5.5
• Coefficient of performance A-7W35	COP	3.2	3.3
Nominal performance data cooling in acc. with EN 14511			
• Nominal heat output A35W18	kW	5.1	9.5
• Energy efficiency ratio A35W18	EER	4.5	4.1
• Nominal heat output A35W7	kW	3.4	6.8
• Energy efficiency ratio A35W7	EER	3.2	3.0
Sound data			
• Sound power level EN 12102 indoor	dB(A)	44	42
• Sound power level EN 12102 outdoor [3)]	dB(A)	44	51
• Sound pressure level at 5 m	dB(A)	25	32
• Sound pressure level at 10 m	dB(A)	19	26
Hydraulic data			
• Max. flow temperature	°C	62	60
• Max. flow of heating water with A7/W35, 5 K ΔT	m^3/h	1.5	2.5
• Residual overpressure of heating pump at nominal output	kPa	49	68
• Max. operating pressure on the heating side	bar	3	3
• Flow/return connection heating	R	1″	1″
• Built-in condensate drain (hose connection)	mm	35	35
• Built-in fan		Centrifugal fan	Centrifugal fan
• Air quantity at max. speed A7W35	m^3/h	2200	3900
• Residual pressure at maximum rpm	Pa	150	110
Cooling technical data			
• Refrigerant		R410A	R410A
• Compressor/stages		Inverter/1	Inverter/1
• Refrigerant filling quantity	kg	3.2	6.2
• Compressor oil filling quantity (FV50S)	l	0.35	1.90

Type		(8)	(13)
Electrical data			
• Electrical connection compressor	V/Hz	1~230/50	3~400/50
• Electrical connection electric heating element	V/Hz	3~400/50 opt. 1~230/50	3~400/50
• Control electrical connection	V/Hz	1~230/50	1~230/50
• Max. compressor operating current	A	15.3	19.7
• Max. electric heating element operating current	A	13	13
• Max. output for electric heating element	kW	6	6
• Max. fan operating current	A	0.24	0.50
• Max. fan power consumption	W	56	115
• Max. compressor starting current	A	15.3	19.7
• Protection main fuse	A	C 16	C 20
• Protection control fuse	A	B 13	B 13
• Fuse electric heating element	A	B 13	B 13
Dimensions/weight			
• Dimensions (H x W x D)	mm	1830 x 910 x 780	1830 x 910 x 780
• Weight	kg	280	298
• Tilting measure	mm	2028	2028
• Minimum sizes of installation room	m^3	7.3	14.1

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

[2] 4 % can be added for class IV heat pump incl. control and room thermostat.

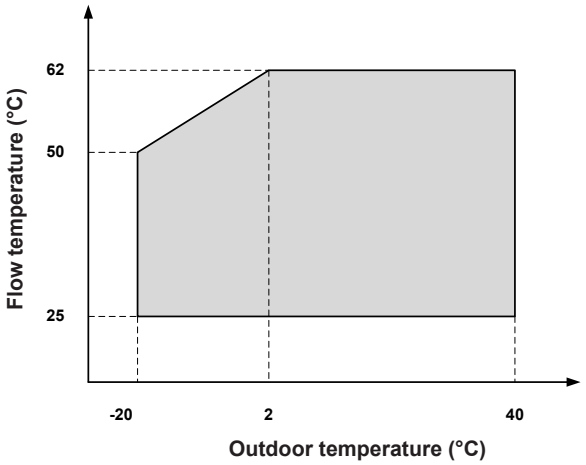
[3] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

Using a fault-current circuit breaker RCCB type B. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

Graphs of operating range

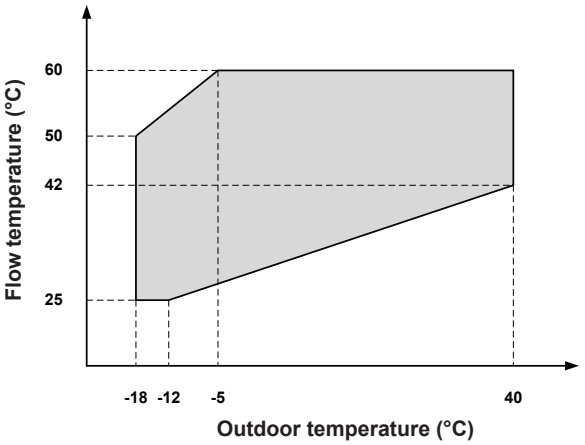
Heating and hot water

Belaria® comfort ICM (8)



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

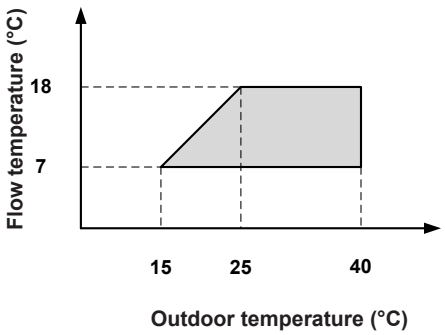
Belaria® comfort ICM (13)



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

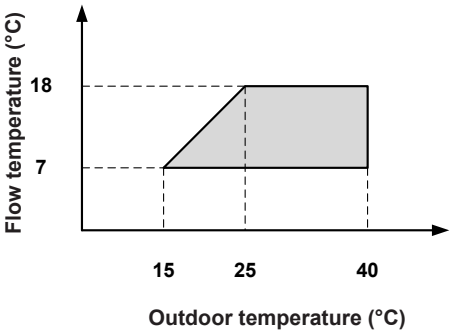
Cooling

Belaria® comfort ICM (8)



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

Belaria® comfort ICM (13)



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

Belaria® comfort ICM (8,13)

Sound pressure level – sound power level
The **sound pressure level** is dependent on the **place of measurement** and the installation environment within a sound field and describes the sound intensity at this point. In contrast, the **sound power level** is a characteristic of the sound source and therefore does not change with distance; it describes the totality of sound power of the relevant source radiated in all directions.

The effective sound pressure in the installation room depends on various factors such as room size, absorption capacity, reflection, free sound propagation, etc.
For this reason, it is important to ensure that where possible, the boiler room is outside noise-sensitive areas of the building and equipped with a sound-absorbing door.

Structure-borne sound
To prevent the transmission of structure-borne sound, all connections must be fitted with compensators or vibration dampers.

Type (indications for equipment room)		(8)	(13)
• Standard installation Sound power level	dB(A)	44	42

Outlet and intake directly through the wall
The sound pressure levels indicated below apply if the air intake and outlet are positioned across a corner from each other on a straight wall with weather protection grille without roofing.

Type (indications for outside)		(8)	(13)
• Sound power level [1)]	dB(A)	44	51
• Sound pressure level at 5 m [1)]	dB(A)	25	32
• Sound pressure level at 10 m [1)]	dB(A)	19	26

[1)] The sound power levels apply in whisper mode. Values increase by + 4 dB(A) in normal operation.

Reduced sound levels (outside) as a result of the installation situation

The following reductions in the sound levels can be assumed as a result of the installation of the following components in the air duct:

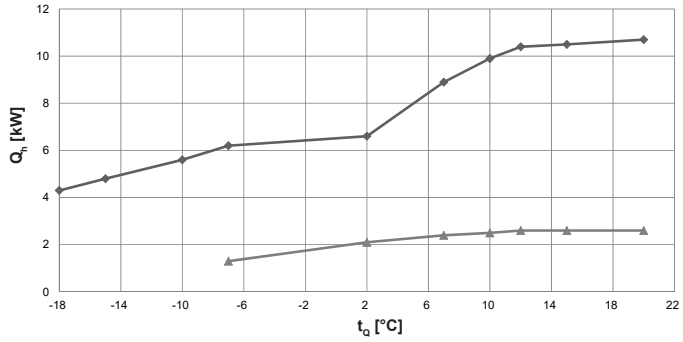
- Light well from a depth of 1.5 m: - 4 dB(A)
- Air hose sound-insulated on the inside, L < 2 m: - 4 dB(A)
- Air hose sound-insulated on the inside, L > 2 m: - 6 dB(A)

Performance data – heating

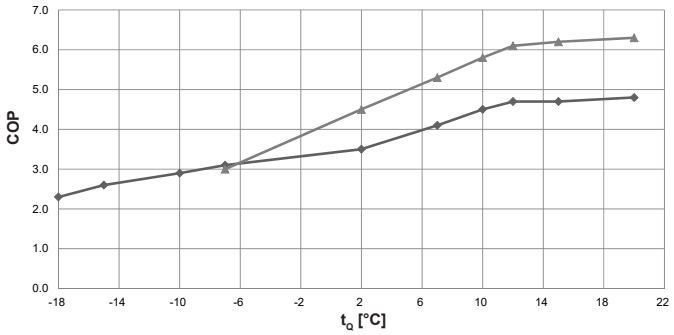
Maximum heat output allowing for defrosting losses

Belaria® comfort ICM (8)

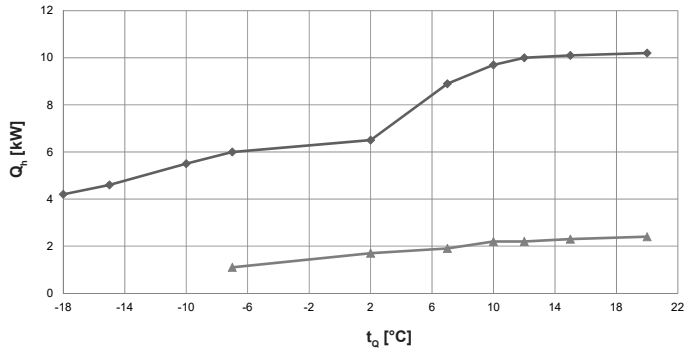
Heat output - t_{VL} 35 °C



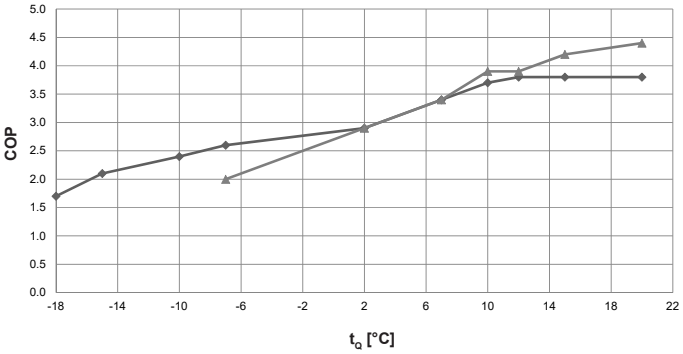
Coefficient of performance - t_{VL} 35 °C



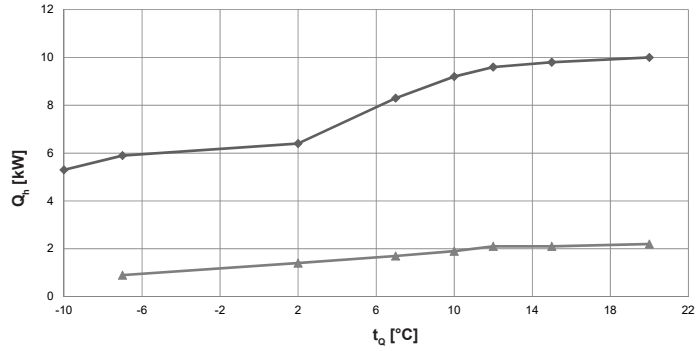
Heat output - t_{VL} 45 °C



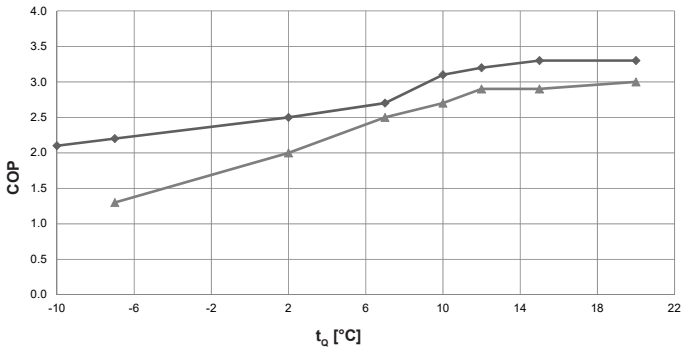
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



t_{VL} = heating flow temperature (°C)
t_Q = 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® comfort ICM (8)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-18	4.3	1.8	2.3	-	-	-
	-15	4.8	1.8	2.6	-	-	-
	-10	5.6	1.9	2.9	-	-	-
	-7	6.2	1.9	3.1	1.3	0.5	3.0
	2	6.6	1.9	3.5	2.1	0.5	4.5
	7	8.9	2.1	4.1	2.4	0.4	5.3
	10	9.9	2.2	4.5	2.5	0.4	5.8
	12	10.4	2.2	4.7	2.6	0.4	6.1
	15	10.5	2.2	4.7	2.6	0.4	6.2
	20	10.7	2.2	4.8	2.6	0.4	6.3
45	-18	4.2	2.1	2.0	-	-	-
	-15	4.6	2.2	2.1	-	-	-
	-10	5.5	2.3	2.4	-	-	-
	-7	6.0	2.4	2.6	1.1	0.6	2.0
	2	6.5	2.2	2.9	1.7	0.6	2.9
	7	8.9	2.6	3.4	1.9	0.6	3.4
	10	9.7	2.6	3.7	2.2	0.6	3.9
	12	10.0	2.7	3.8	2.2	0.6	3.9
	15	10.1	2.7	3.8	2.3	0.6	4.2
	20	10.2	2.7	3.8	2.4	0.6	4.4
50	-18	3.4	2.3	1.5	-	-	-
	-15	3.9	2.4	1.6	-	-	-
	-10	4.9	2.5	1.9	-	-	-
	-7	5.6	2.5	2.2	1.2	0.6	1.9
	2	5.9	2.4	2.4	1.8	0.6	3.1
	7	7.9	2.9	2.8	2.1	0.6	3.5
	10	8.7	3.0	2.9	2.2	0.6	3.8
	12	9.0	3.0	3.0	2.2	0.6	3.8
	15	9.4	3.0	3.1	2.3	0.6	4.0
	20	9.7	3.0	3.2	2.4	0.6	4.1
55	-18	4.0	2.4	1.7	-	-	-
	-15	4.4	2.5	1.8	-	-	-
	-10	5.3	2.6	2.1	-	-	-
	-7	5.9	2.7	2.2	0.9	0.7	1.3
	2	6.4	2.6	2.5	1.4	0.7	2.0
	7	8.3	3.1	2.7	1.7	0.7	2.5
	10	9.2	3.0	3.1	1.9	0.7	2.7
	12	9.6	3.0	3.2	2.1	0.7	2.9
	15	9.8	3.0	3.3	2.1	0.7	2.9
	20	10.0	3.0	3.3	2.2	0.7	3.0
60	-7	5.2	2.6	2.0	-	-	-
	2	5.6	2.5	2.2	1.3	0.8	1.6
	7	7.3	3.0	2.5	1.6	0.8	2.0
	10	8.1	2.9	2.8	1.8	0.8	2.3
	12	8.5	2.9	2.9	2.0	0.8	2.5
	15	8.6	2.9	3.0	2.0	0.8	2.5
	20	8.8	2.9	3.0	2.1	0.8	2.7

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 of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

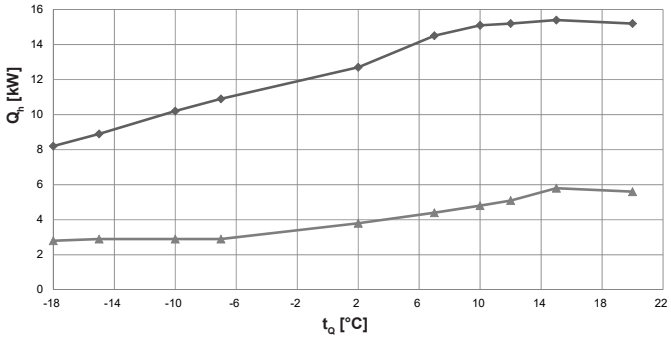
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – heating

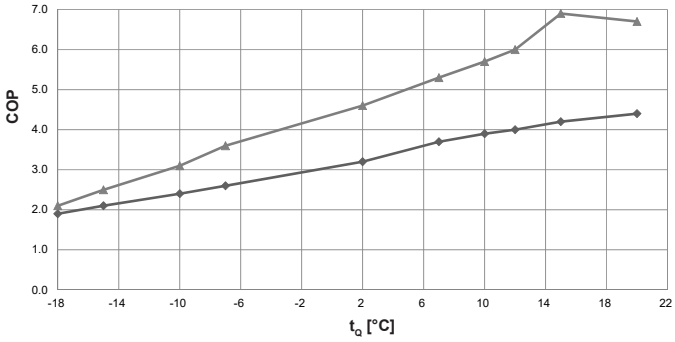
Maximum heat output allowing for defrosting losses

Belaria® comfort ICM (13)

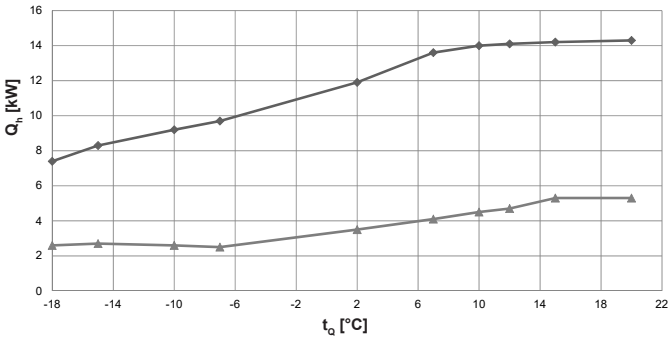
Heat output - t_{VL} 35 °C



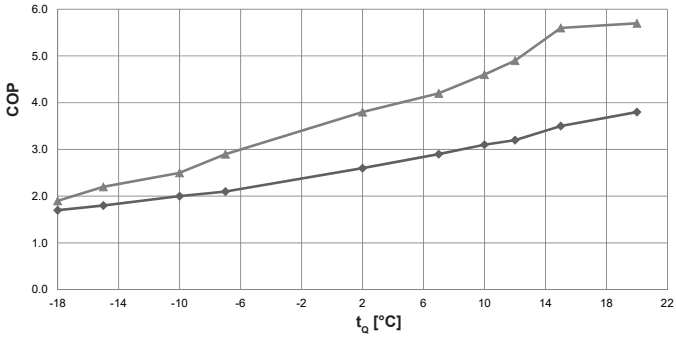
Coefficient of performance - t_{VL} 35 °C



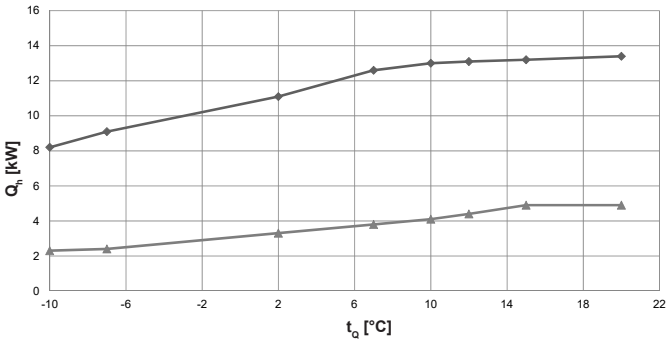
Heat output - t_{VL} 45 °C



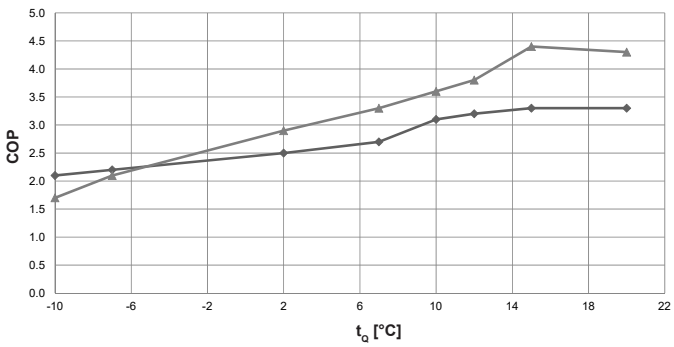
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



t_{VL} = heating flow temperature (°C)
t_Q = 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® comfort ICM (13)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	-18	8.2	4.3	1.9	2.8	1.3	2.1
	-15	8.9	4.3	2.1	2.9	1.2	2.5
	-10	10.2	4.2	2.4	2.9	0.9	3.1
	-7	10.9	4.2	2.6	2.9	0.8	3.6
	2	12.7	4.0	3.2	3.8	0.8	4.6
	7	14.5	3.9	3.7	4.4	0.8	5.3
	10	15.1	3.9	3.9	4.8	0.8	5.7
	12	15.2	3.8	4.0	5.1	0.9	6.0
	15	15.4	3.7	4.2	5.8	0.8	6.9
	20	15.2	3.4	4.4	5.6	0.8	6.7
45	-18	7.4	4.4	1.7	2.6	1.4	1.9
	-15	8.3	4.6	1.8	2.7	1.2	2.2
	-10	9.2	4.6	2.0	2.6	1.0	2.5
	-7	9.7	4.6	2.1	2.5	0.9	2.9
	2	11.9	4.5	2.6	3.5	0.9	3.8
	7	13.6	4.6	2.9	4.1	1.0	4.2
	10	14.0	4.5	3.1	4.5	1.0	4.6
	12	14.1	4.4	3.2	4.7	1.0	4.9
	15	14.2	4.1	3.5	5.3	0.9	5.6
	20	14.3	3.8	3.8	5.3	0.9	5.7
55	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	8.2	6.1	1.4	2.3	1.4	1.7
	-7	9.1	6.0	1.5	2.4	1.2	2.1
	2	11.1	5.6	2.0	3.3	1.2	2.9
	7	12.6	5.6	2.3	3.8	1.2	3.3
	10	13.0	5.3	2.5	4.1	1.1	3.6
	12	13.1	5.1	2.5	4.4	1.2	3.8
	15	13.2	4.9	2.7	4.9	1.1	4.4
	20	13.4	4.7	2.8	4.9	1.1	4.3
60	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	-	-	-	-	-	-
	-7	-	-	-	-	-	-
	2	10.6	6.2	1.7	3.2	1.3	2.5
	7	11.9	6.1	2.0	3.6	1.3	2.8
	10	12.4	5.9	2.1	3.9	1.3	3.1
	12	12.5	5.7	2.2	4.2	1.3	3.3
	15	12.7	5.5	2.3	4.7	1.3	3.8
	20	13.1	5.3	2.5	4.8	1.3	3.7

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 of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

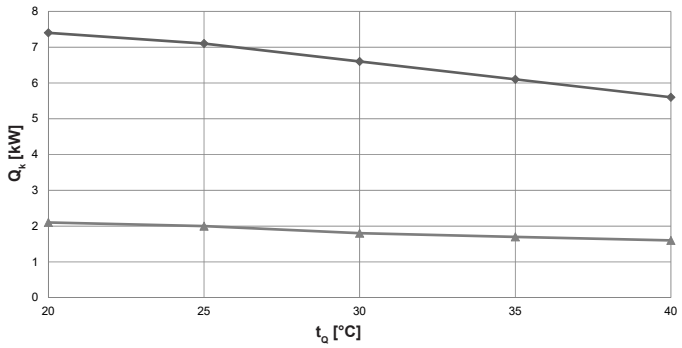
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

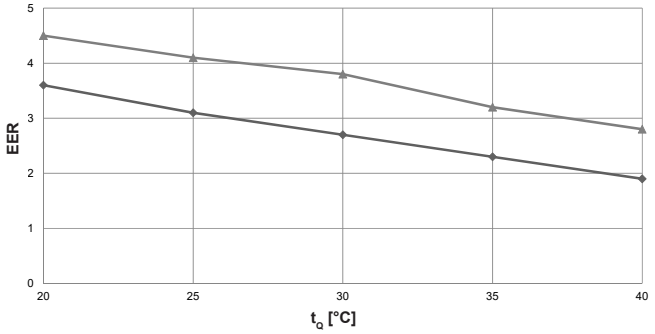
Maximum cooling capacity

Belaria® comfort ICM (8)

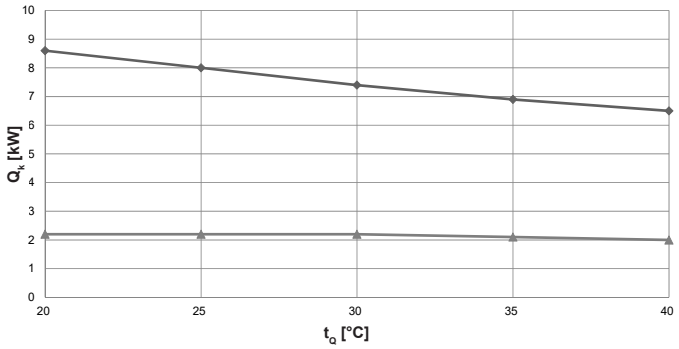
Cooling capacity - t_{VL} 7 °C



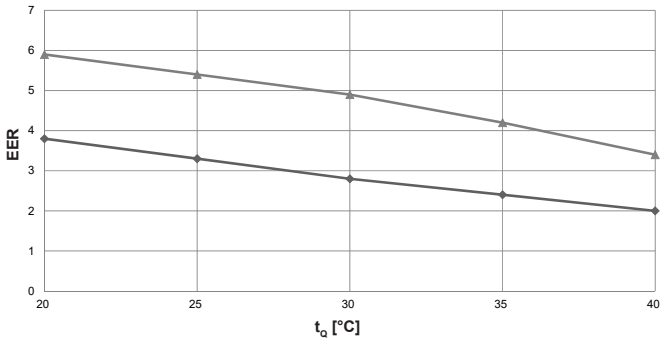
Energy efficiency ratio - t_{VL} 7 °C



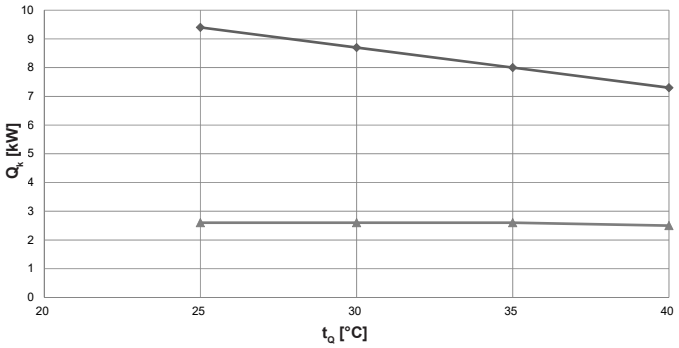
Cooling capacity - t_{VL} 12 °C



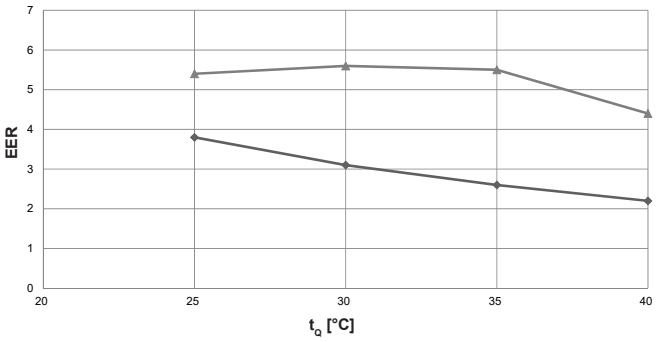
Energy efficiency ratio - t_{VL} 12 °C



Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



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

Maximum output
Minimum output

Performance data – cooling

Belaria® comfort ICM (8)

Data according to EN 14511

		Maximum output			Minimum output		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	20	7.4	2.1	3.6	2.1	0.5	4.5
	25	7.1	2.3	3.1	2.0	0.5	4.1
	30	6.6	2.5	2.7	1.8	0.5	3.8
	35	6.1	2.7	2.3	1.7	0.5	3.2
	40	5.6	2.9	1.9	1.6	0.6	2.8
12	15	-	-	-	-	-	-
	20	8.6	2.3	3.8	2.2	0.8	5.9
	25	8.0	2.4	3.3	2.2	0.9	5.4
	30	7.4	2.6	2.8	2.2	1.0	4.9
	35	6.9	2.9	2.4	2.1	1.1	4.2
	40	6.5	6.2	2.0	2.0	1.2	3.4
18	15	-	-	-	-	-	-
	20	-	-	-	-	-	-
	25	9.4	2.5	3.8	2.6	0.5	5.4
	30	8.7	2.9	3.1	2.6	0.5	5.6
	35	8.0	3.1	2.6	2.6	0.5	5.5
	40	7.3	3.4	2.2	2.5	0.6	4.4

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

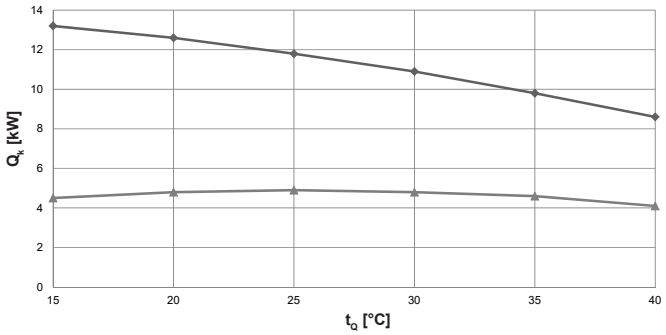
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

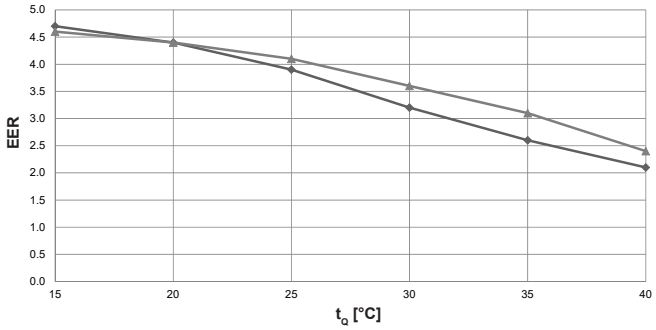
Maximum cooling capacity

Belaria® comfort ICM (13)

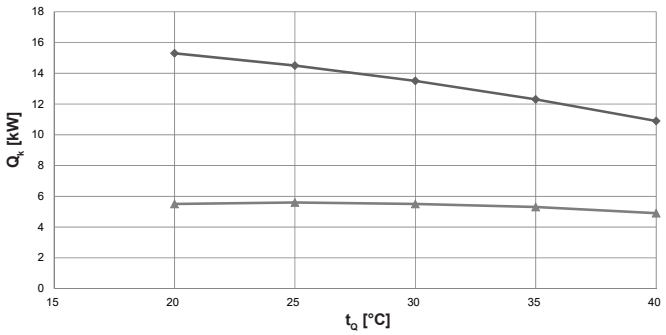
Cooling capacity - t_{VL} 7 °C



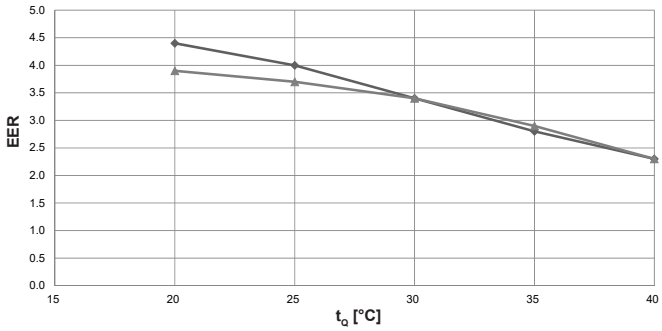
Energy efficiency ratio - t_{VL} 7 °C



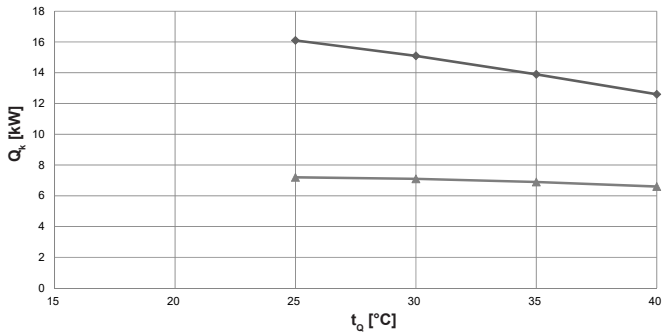
Cooling capacity - t_{VL} 12 °C



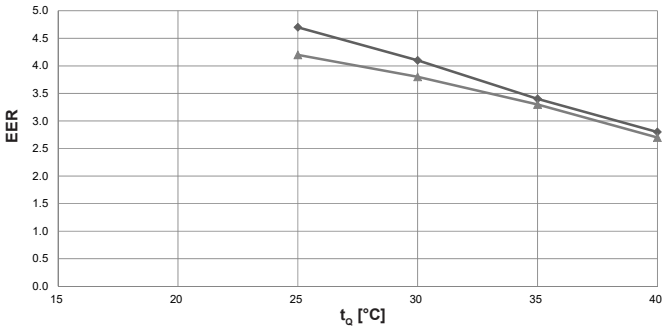
Energy efficiency ratio - t_{VL} 12 °C



Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



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

Maximum output
Minimum output

Performance data – cooling

Belaria® comfort ICM (13)

Data according to EN 14511

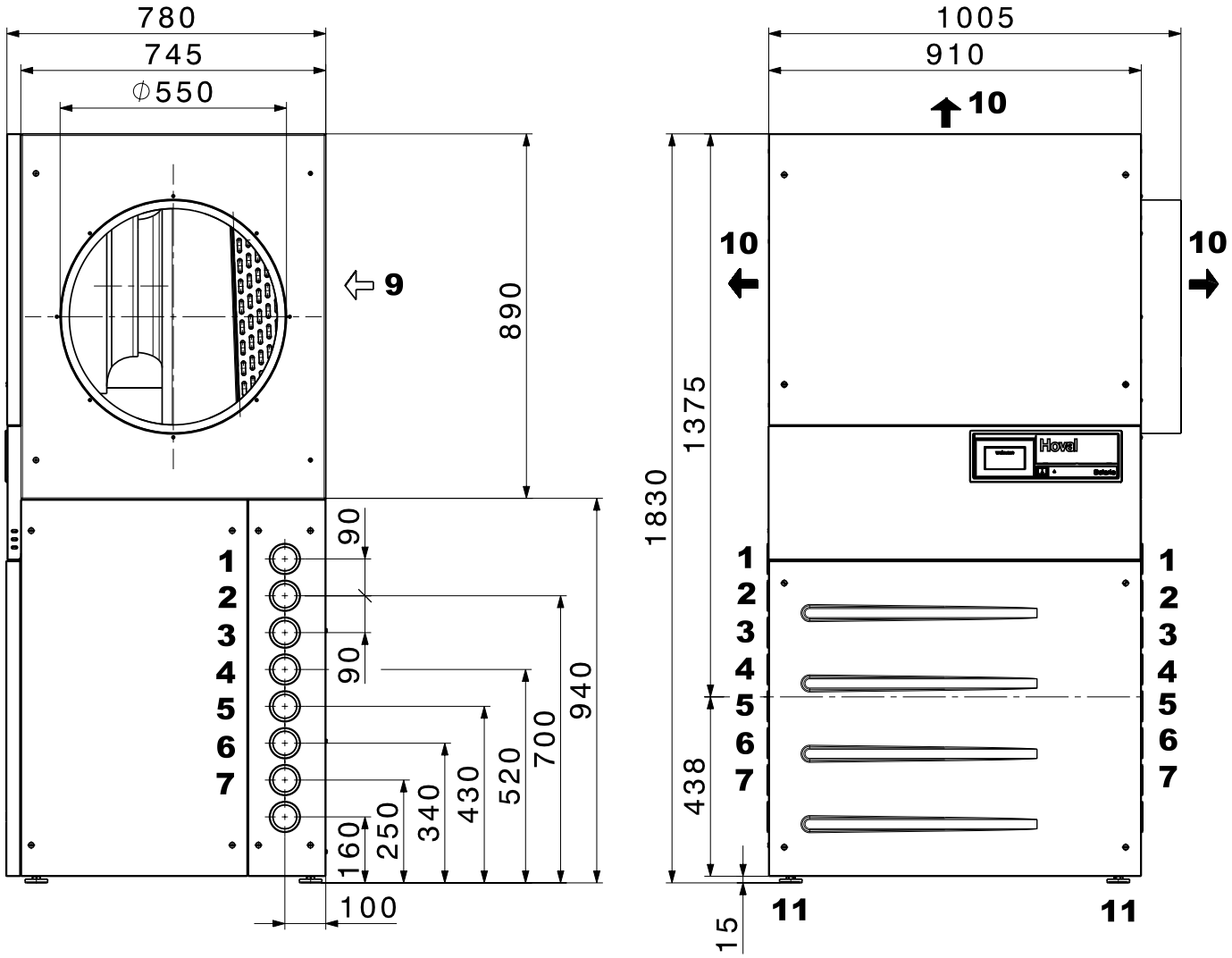
t_{VL} °C	t_Q °C	Maximum output Q_k kW	Maximum output P kW	Maximum output EER	Minimum output Q_k kW	Minimum output P kW	Minimum output EER
7	15	13.2	2.8	4.7	4.5	1.0	4.6
	20	12.6	2.9	4.4	4.8	1.1	4.4
	25	11.8	3.0	3.9	4.9	1.2	4.1
	30	10.9	3.4	3.2	4.8	1.3	3.6
	35	9.8	3.7	2.6	4.6	1.5	3.1
	40	8.6	4.2	2.1	4.1	1.7	2.4
12	15	-	-	-	-	-	-
	20	15.3	3.5	4.4	5.5	1.4	3.9
	25	14.5	3.6	4.0	5.6	1.5	3.7
	30	13.5	4.0	3.4	5.5	1.7	3.4
	35	12.3	4.4	2.8	5.3	1.9	2.9
	40	10.9	4.9	2.3	4.9	2.1	2.3
18	15	-	-	-	-	-	-
	20	-	-	-	-	-	-
	25	16.1	3.5	4.7	7.2	1.7	4.2
	30	15.1	3.7	4.1	7.1	1.9	3.8
	35	13.9	4.1	3.4	6.9	2.1	3.3
	40	12.6	4.6	2.8	6.6	2.4	2.7

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

Observe daily power interruptions!
see “Engineering heat pumps general”

Belaria® comfort ICM (8,13)

(Dimensions in mm)



Connections optionally on the left or right
Conversion on site

1 DHW flow R 1″
2 Heating flow R1″
3 Condensate drain
4 Heating return R1″
5 Main electrical connection
Electrical heating insert
6 Control current connection
7 Free
8 Control panel
9 Air intake (evaporator inlet)
10 Air outlet opening, outlet upwards
only possible in version “Flex”
11 Adjustable feet

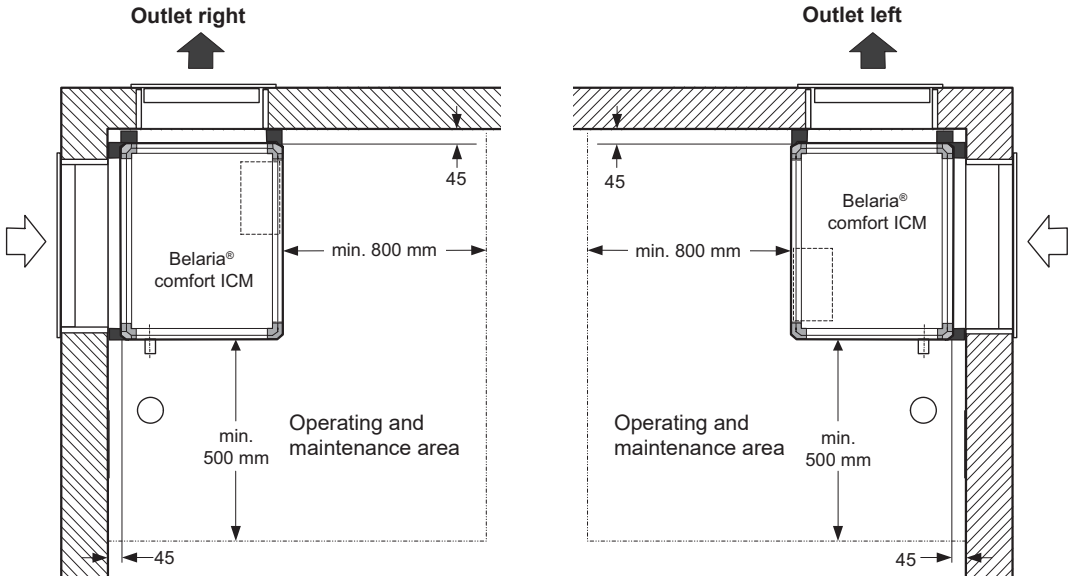
* Dimensions of the divided version of the Belaria® comfort ICM (8,13)

Space requirement “standard” installation with wall insulation MI

“Standard” installation with wall insulation MI
Installation in the corner of the boiler room, directly on the outside wall, with wall connection element and weatherproof grille. Intake at the back, outlet to the right (preferred) or to the left. Water connections on the opposite side.

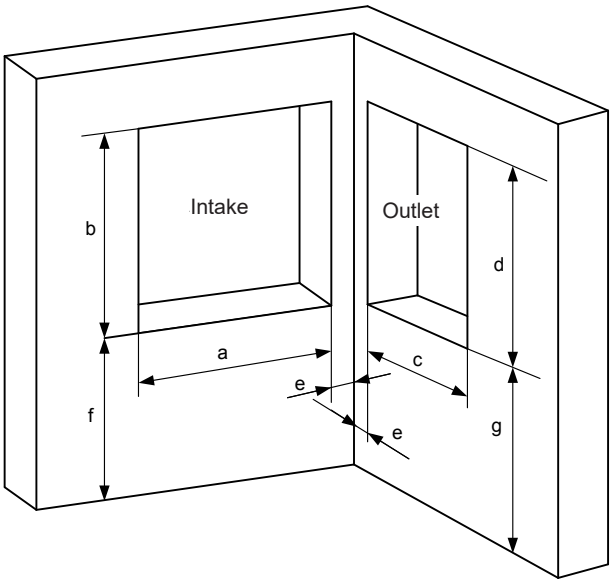
Cut-outs
The cut-outs must be created professionally and without cold bridges! The dimensions of the cut-outs are “clear dimensions” measured from the finished floor!

Air ducts
Concrete ducts have unfavourable acoustic properties and often magnify sound emissions. It is therefore advisable to equip the air ducts with a sound-absorbing, weatherproof lining. The air ducts must be drained.

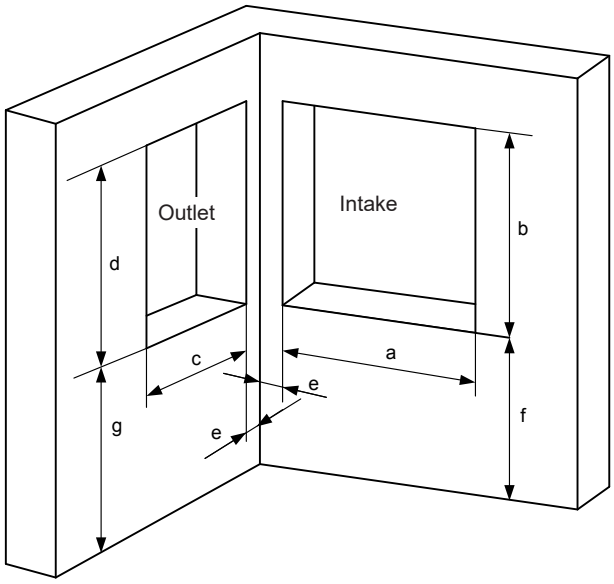


Cut-out dimensions
“Standard” installations - heat pump in the corner, without air ducts, with wall insulation MI
(Dimensions in mm)
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of finished floor.

Standard installation 1
Air outlet to the right
Preferred solution due to ease of access for servicing



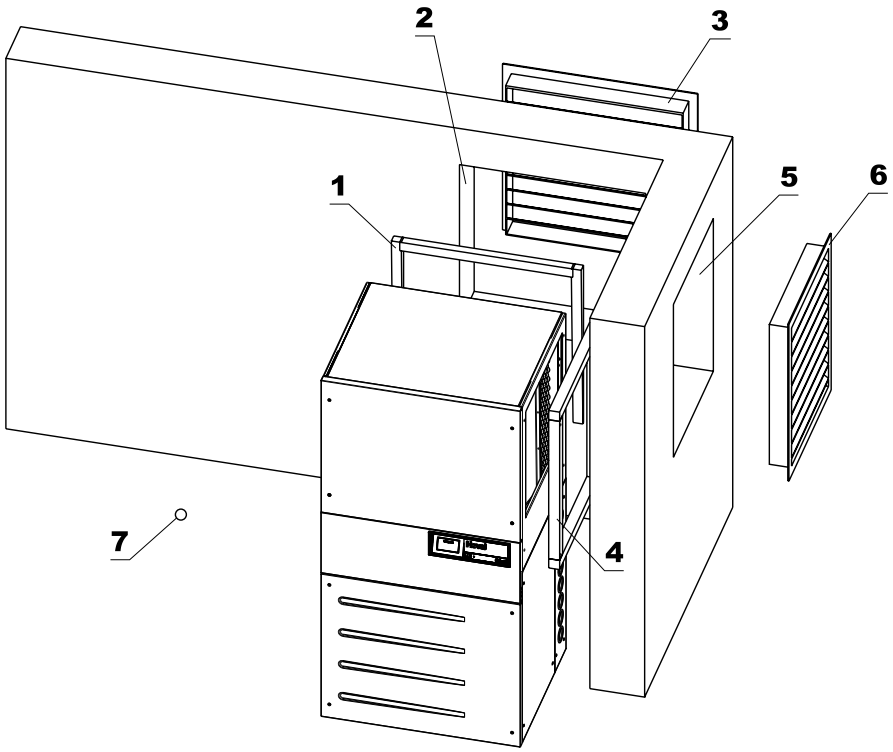
Standard installation 2
Air outlet to the left



Cut-out dimensions

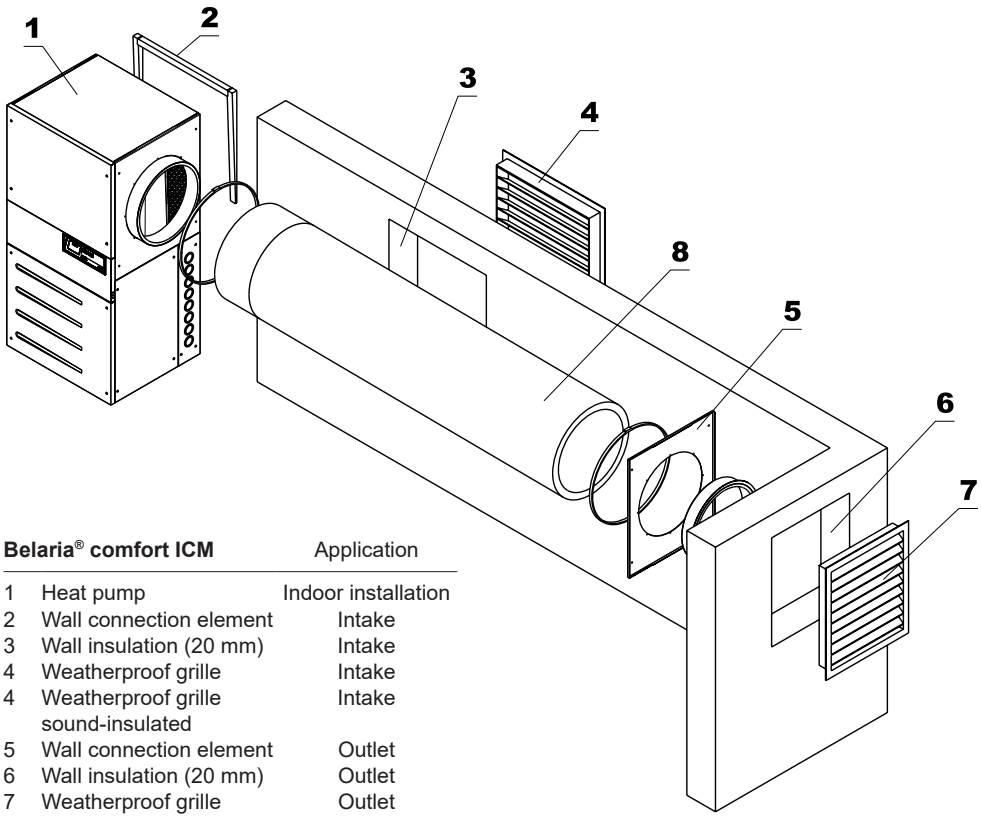
Belaria® comfort ICM	a	b	c	d	e	f	g
(8,13)	850	855	680	825	80	960	960

Space requirement “standard” installation with wall insulation MI



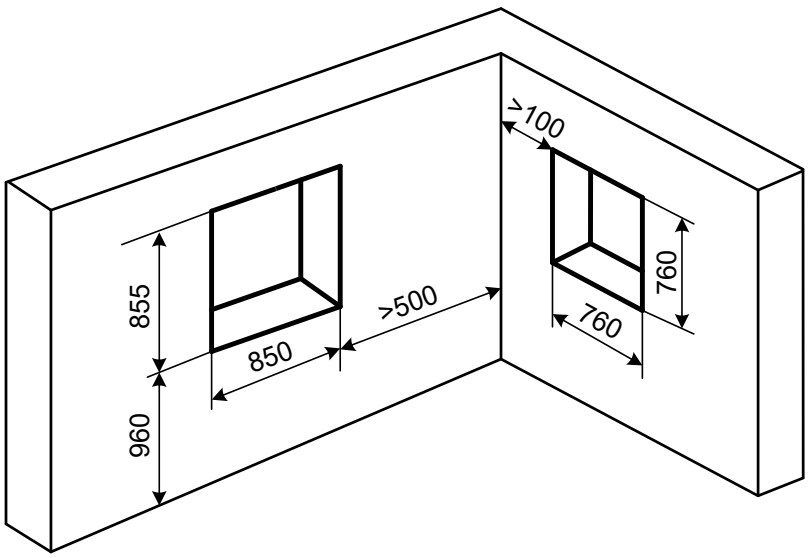
Belaria® comfort ICM		Application	Accessory type
Heat pump		Indoor installation	
1	Wall connection element	Intake	WA-E01
2	Wall insulation	Intake	MI
3	Weatherproof grille	Intake	WG-E01
3	Weatherproof grille sound-insulated	Intake	WG-E01
4	Wall connection set	Outlet	WA-A01
5	Wall insulation	Outlet	MI
6	Weatherproof grille	Outlet	WG-A01
6	Weatherproof grille sound-insulated	Outlet	WG-A01
7	Condensate drain		

Space requirement “Flex” installation with wall insulation MI

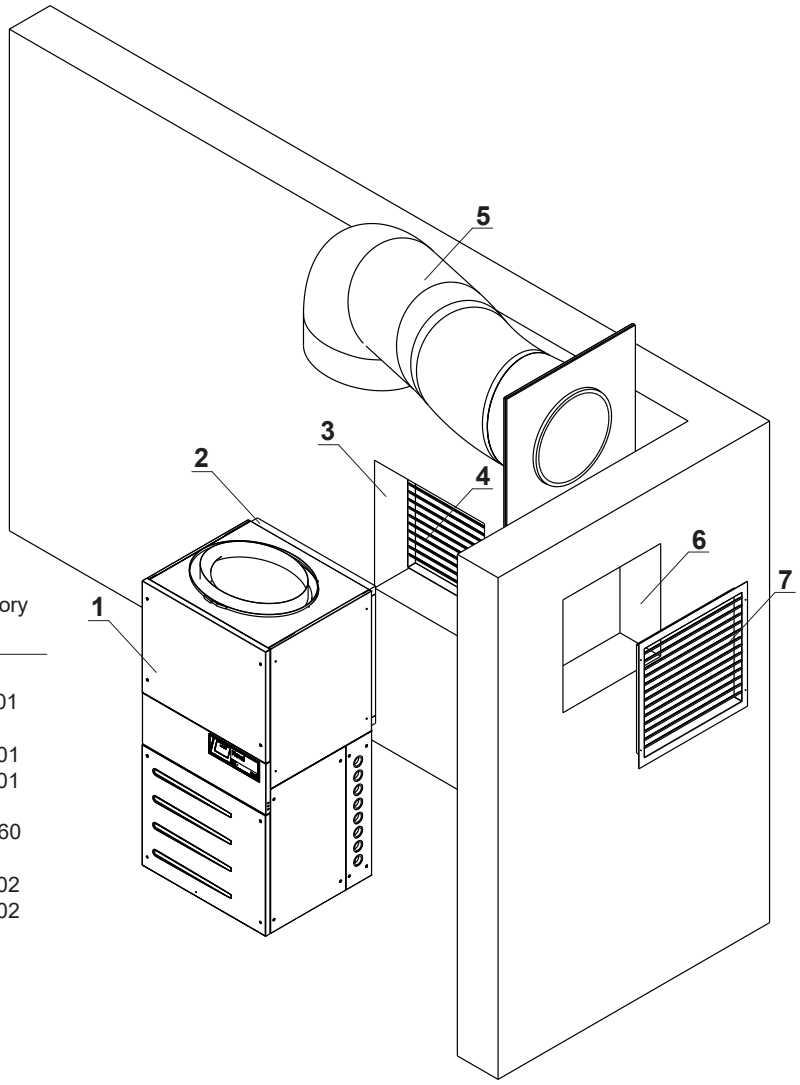


Belaria® comfort ICM		Application
1	Heat pump	Indoor installation
2	Wall connection element	Intake
3	Wall insulation (20 mm)	Intake
4	Weatherproof grille	Intake
4	Weatherproof grille sound-insulated	Intake
5	Wall connection element	Outlet
6	Wall insulation (20 mm)	Outlet
7	Weatherproof grille	Outlet
7	Weatherproof grille sound-insulated	Outlet
8	Air hose Ø 560 mm	Outlet

Cut-out dimensions
“Flex” installations with wall insulation MI
(Dimensions in mm)
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of finished floor.

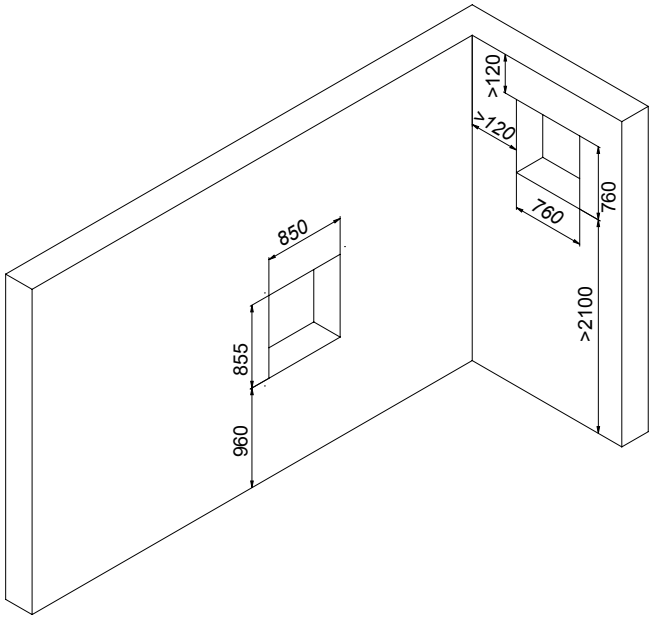


Space requirement “Flex” installation with wall insulation MI, outlet on top via flexible hose



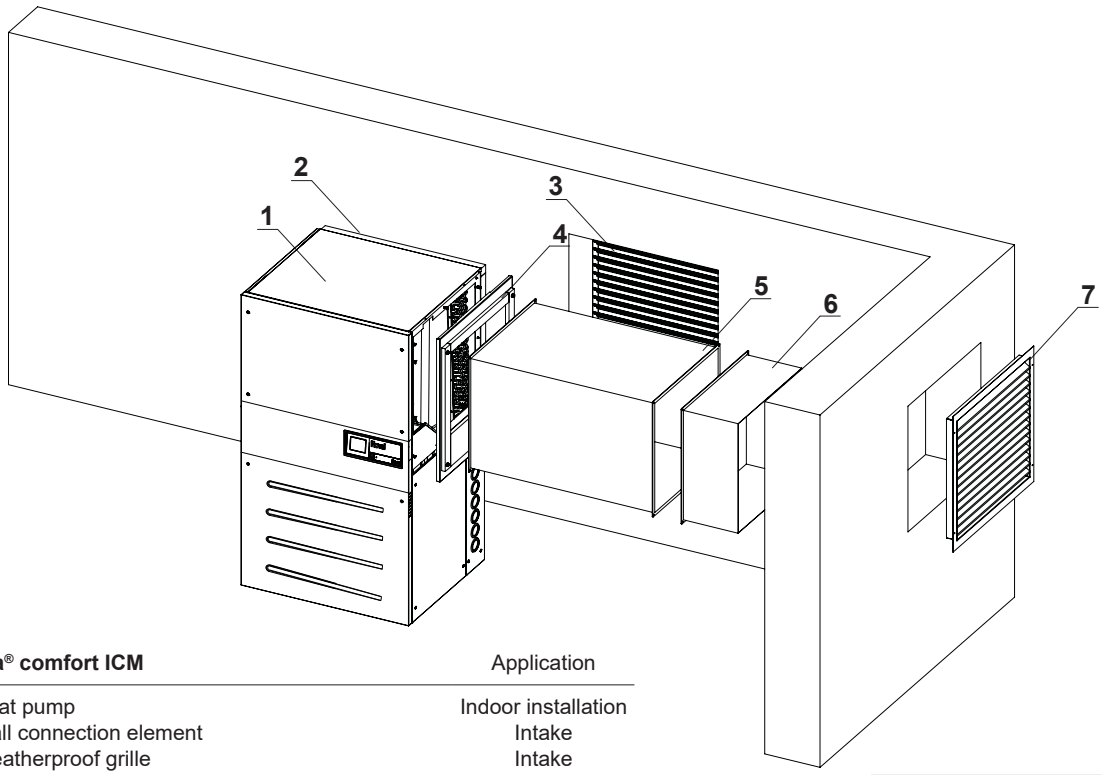
Belaria® comfort ICM		Application	Accessory type
1	Heat pump	Indoor installation	
2	Wall connection element	Intake	WA-E01
3	Wall insulation (20 mm)	Intake	MI
4	Weatherproof grille	Intake	WG-E01
4	Weatherproof grille sound-insulated	Intake	WG-E01
5	Air hose set	Outlet	LSO 560
6	Wall insulation (20 mm)	Outlet	MI
7	Weatherproof grille	Outlet	WG-A02
7	Weatherproof grille sound-insulated	Outlet	WG-A02

Cut-out dimensions
“Flex” installations with wall insulation MI
(Dimensions in mm)
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of finished floor.



Outlet right

Space requirement “Duct” indoor installation, straight

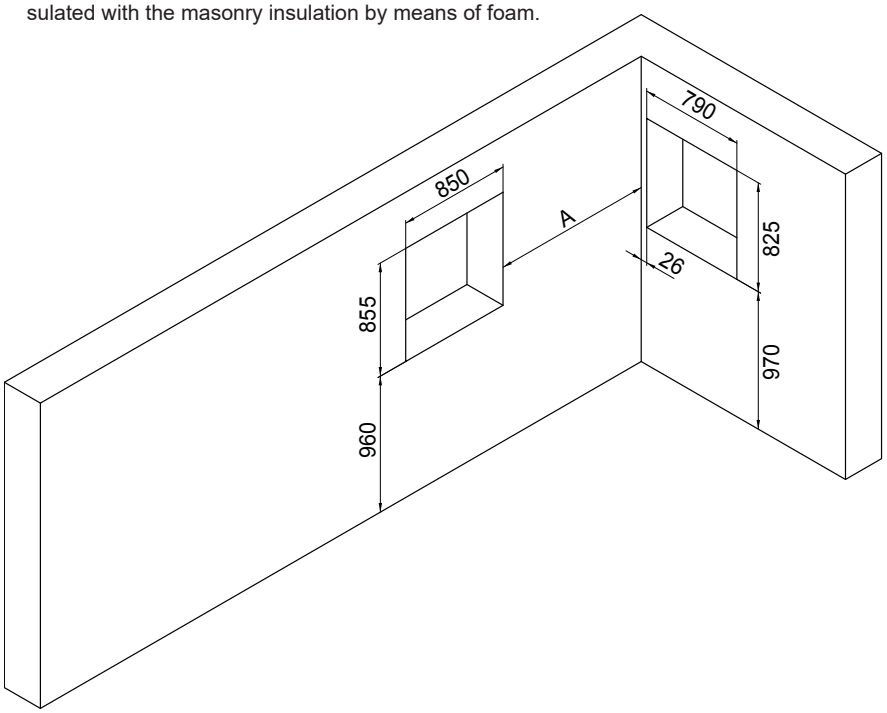


Belaria® comfort ICM		Application
1	Heat pump	Indoor installation
2	Wall connection element	Intake
3	Weatherproof grille	Intake
4	Blow-out panel cpl. - duct connection RAL 3000	Outlet
5	Air duct LKG10 - 1.0 m	Outlet
	Air duct LKG15 - 1.5 m	Outlet
6	Wall fitting MS01	Outlet
7	Weatherproof grille	Outlet
7	Weatherproof grille sound-insulated	Outlet

Notice
Ducts can be shortened!

The wall insulation (20 mm) is not required when using the wall fitting MS01.

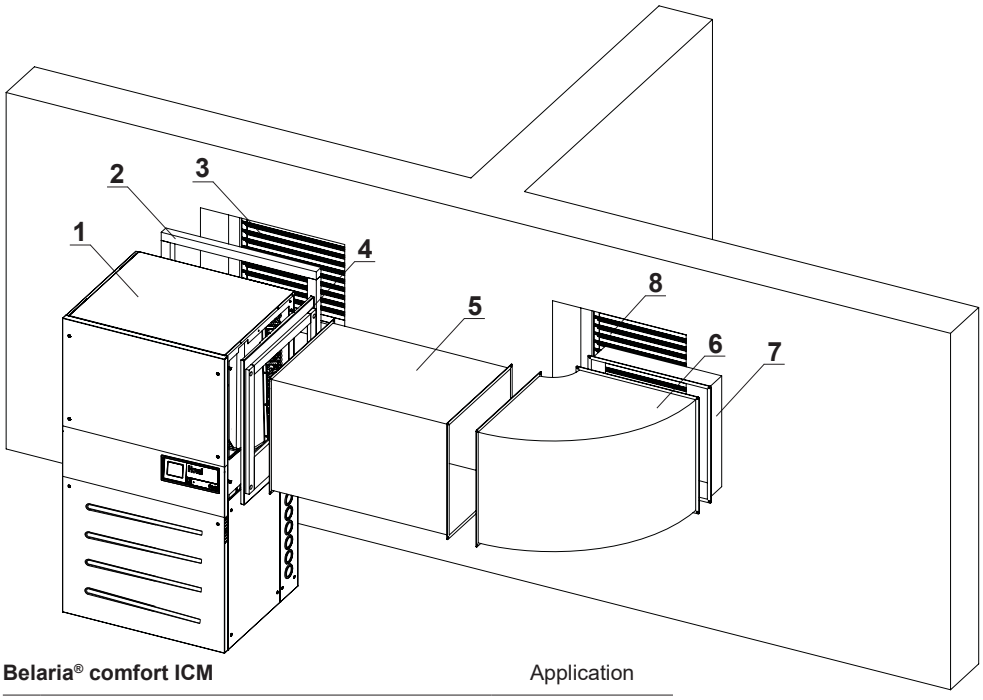
Cut-out dimensions
“Duct” indoor installation, straight
(Dimensions in mm)
- The cut-outs must be created professionally.
- The masonry support is fixed into the wall opening insulated with the masonry insulation by means of foam.



A depends on the selection of the air duct:

Length of air duct	A
1000	1130
1500	1630

Space requirement “Duct” indoor installation with elbow

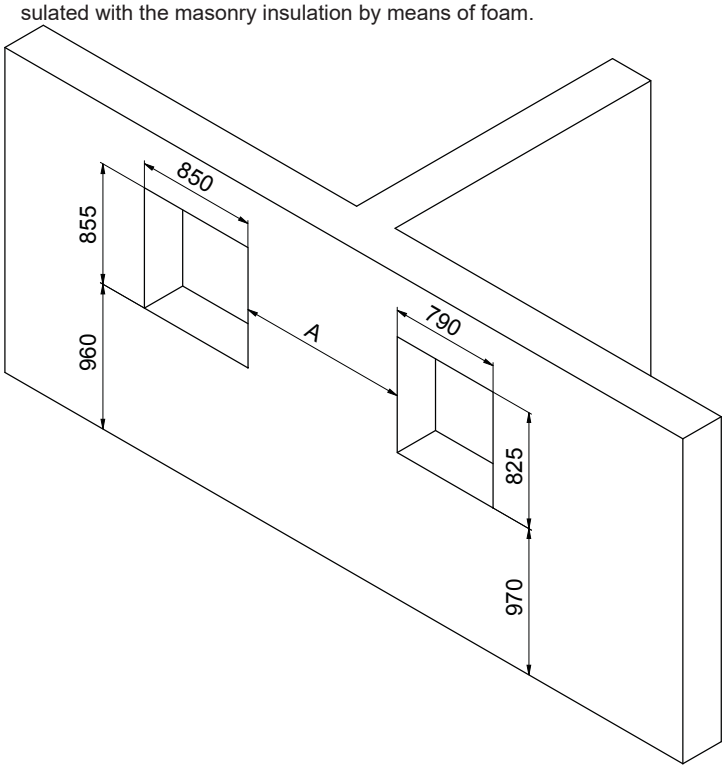


Belaria® comfort ICM		Application
1	Heat pump	Indoor installation
2	Wall connection element	Intake
3	Weatherproof grille	Intake
4	Blow-out panel cpl. - duct connection RAL 3000	Outlet
5	Air duct LKG10 - 1.0 m Air duct LKG15 - 1.5 m	Outlet
6	Air duct elbow LKB90 - 90°	Outlet
7	Wall fitting MS01	Outlet
8	Weatherproof grille	Outlet
8	Weatherproof grille sound-insulated	Outlet

Notices
- Ducts can be shortened!
- In order to prevent an air short circuit, the partition must be positioned between the suction and exhaust opening.

The wall insulation (20 mm) is not required when using the wall fitting MS01.

Cut-out dimensions
“Duct” indoor installation with elbow
(Dimensions in mm)
- The cut-outs must be created professionally.
- The masonry support is fixed into the wall opening insulated with the masonry insulation by means of foam.



A depends on the selection of the air duct:

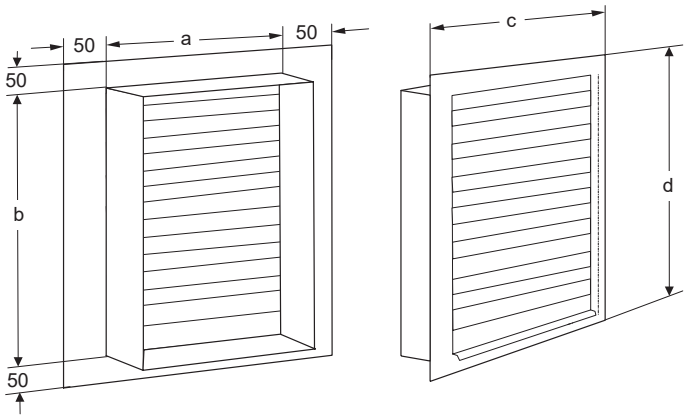
Length of air duct	A
1000	1126
1500	1626

Weatherproof grille
(Dimensions in mm)

Weatherproof grille made of aluminium with mesh grille.

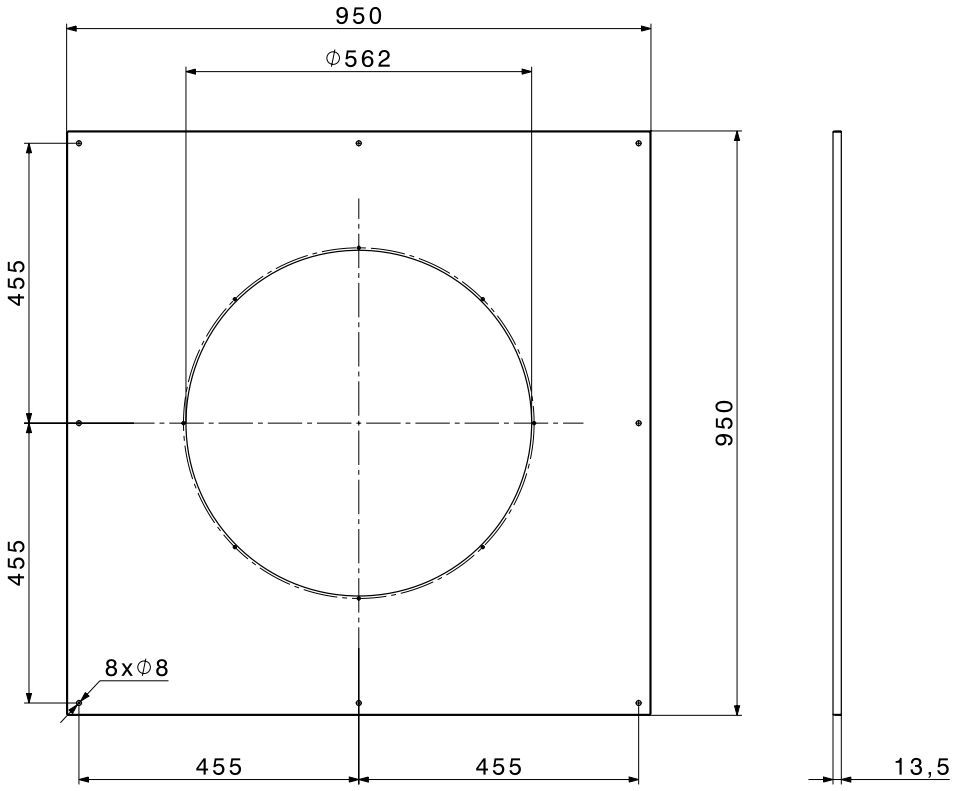
For the openings with Hoval wall insolation type MI-E01 (suction) or MI-A01, MI-A02 (exhaust).

If the thermal insulation for the wall openings is provided on-site, it must be 20 mm thick!



Weatherproof grille type	Belaria® comfort ICM type	Application for	a	b	c	d
WG-E01	8,13	Intake	810	796	890	896
WG-A01	8,13	Outlet	640	746	720	846
WG-A02	8,13	Outlet Flex	720	696	800	796
WG-MS01	8,13	Outlet duct	750	746	830	846

Wall connection element Belaria® comfort ICM
(Dimensions in mm)



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

Hoval Belaria® twin I
Hoval Belaria® twin IR

Air/water heat pump

- Air/water heat pump in compact design for indoor installation
- Sturdy housing without cold bridges with steel/plastic section frame and plastic corner connections. Removable side walls (panels) made of power-coated Zincor sheet steel with optimum heat and noise insulation Colour light grey (RAL 7035)
- Two suction gas cooled scroll compressors
- With large-area aluminium/copper ribbed pipe evaporator and plate-type condenser made from stainless steel/copper
- Speed-controlled centrifugal fan
- Refrigeration circuit with electronic expansion valve, filter dryer with sight glass, suction-gas heat exchanger, manifold and high-pressure pressure controller
- Two electronic starting current limiters with integrated rotary field/phase monitoring
- With efficient defrosting control via inversion of the refrigeration circuit
- Filled with refrigerant R407C, wired up internally ready for connection
- Hoval Belaria® twin IR with additional cooling function
- Electrical box and terminal box with built-in TopTronic® E controller (integrated at bottom right on front). With monitoring and fault signalling function.

Condensate connection
- The drain pipeline is to be made with sufficient incline and without change of the cross-section.
- Siphon on site

Heat source connections (air intake and air blow-off)
- Air intake from the rear (long side)
- Blow-out opening (can be converted for the air blow-out direction to the side left or right)

Electrical connections
- Connection: at the bottom on the left or right
- Do not attach any rigid connections (e.g. cable duct) to the heat pump housing

Installation
- Variable and cost-effective installation possibilities thanks to blow-off side panel with changeover function

Options for the air duct
- Wall connection element, air intake box, blow-out panel, wall feed-through with weather protection grille or mesh grille

Recommended accessories
- High-efficiency pump with continuously variable speed control, see Accessories

Delivery
- One-piece construction
- Completely packaged

Model range

Belaria® twin I type	35 °C	55 °C	Heat output A2W35 kW stage 1	Heat output A2W35 kW stage 2	Belaria® twin IR type	35 °C	55 °C	Heat output A2W35 kW stage 1	Heat output A2W35 kW stage 2	Cooling capacity A35W18 kW stage 1	Cooling capacity A35W18 kW stage 2
(20)	A++	A+	10.4	20.8	(20)	A++	A+	10.4	20.8	14.3	26.6
(25)	A++	A+	12.5	25.0	(25)	A++	A+	12.5	25.0	15.8	30.3
(30)	A++	A+	15.2	30.4	(30)	A++	A+	15.2	30.4	19.0	35.5

Energy efficiency class of the compound system with control.

TopTronic® E controller

Control panel
- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

TopTronic® E control module
- Simple, intuitive operating concept
- Display of the most important operating statuses
- 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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

TopTronic® E basic module heat generator TTE-WEZ
- Control functions integrated 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 heat balancing or
  - module expansion Universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

Number of modules that can be additionally 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.

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.

Air/water heat pump - 2-stage

Hoval Belaria® twin I

Belaria® twin I type	Heat output with A2W35 kW		Part No.
	stage 1	stage 2	
(20)	10.4	20.8	7019 020
(25)	12.5	25.0	7019 021
(30)	15.2	30.4	7019 022

Air/water heat pump - 2-stage (cooling function)

Hoval Belaria® twin IR

Design as for Hoval Belaria® twin I, but with cooling function

Belaria® twin IR type	Heat output with A2W35 kW		Cooling capacity with A35W18 kW		Part No.
	stage 1	stage 2	stage 1	stage 2	
(20)	10.4	20.8	14.3	26.6	7019 023
(25)	12.5	25.0	15.8	30.3	7019 024
(30)	15.2	30.4	19.0	35.5	7019 025

Notice
Suitable charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0-10 V or PWM1

Premium pump Stratos
with IF module Stratos Ext. Off (0-10 V)

See “Circulating pumps”

Electric heating elements
see “Calorifiers” - chapter “Electric heating elements”

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

Further information
see “Description”

Notice
A buffer storage tank must be provided.

Matching buffer storage tanks
see “Calorifiers”

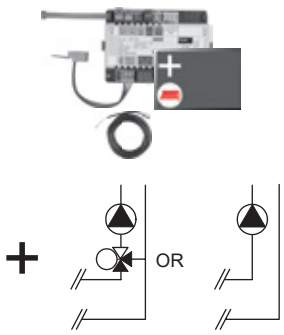
Hose set SPCH32-32-15-2 — 6058 821
for Belaria® twin I/IR (20)
Consisting of:
- 2 reinforced hoses PN 10 DN 32 1¼″ IT insulated for heating side flat-sealing with union nut
- Length: 1.5 m
- Seals

Hose set SPCH40-40-15-2 — 6058 822
for Belaria® twin I/IR (25,30)
Consisting of:
- 2 reinforced hoses PN 10 DN 40 1½″ IT insulated for heating side flat-sealing with union nut
- Length: 1.5 m
- Seals

TopTronic® E module expansions

for TopTronic® E basic module heat generator

Part No.

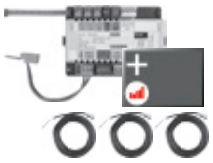


TopTronic® E module expansion heating circuit TTE-FE HK
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

Consisting of:
- Fitting accessories
- 1 contact sensor ALF/2P/4/T, L = 4.0 m
- Basic plug set FE module

6034 576

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

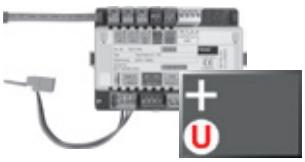


TopTronic® E module expansion heating circuit incl. energy balancing
TTE-FE HK-EBZ
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling 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

6037 062

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

6034 575

Further information
see “Controls” - “Hoval TopTronic® E module expansions” chapter

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

Flow rate sensor sets

Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 8	G ¾″	0.9-15	6038 526
DN 10	G ¾″	1.8-32	6038 507
DN 15	G 1″	3.5-50	6038 508
DN 20	G 1¼″	5-85	6038 509
DN 25	G 1½″	9-150	6038 510

Brass housing

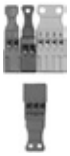
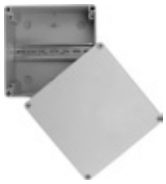
Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950
DN 40	G 2 ″	22-400	6055 092

Hoval recommended use
Flow rate sensor set DN 32 made of brass.
Installation location outside the heat pump.

Recommended accessories:
speed-controlled high-efficiency pump
see “Circulating pumps”

Notice
Installation of a flow rate sensor set is recommended. With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented.
In order to protect the heat pump from frost in the event of a power failure or for example in bivalence mode, a system separation or other technical measures must be provided on site.

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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

	Part No.
 **System water protection filter FGM025-200** For horizontal installation in return For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop Consisting of: - Filter head and bowl in brass - Magnetic insert (nickel-neodymium) - 2 pressure gauges - Very large 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 (Δp < 0.1 bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C - incl. steam diffusion-tight insulating shells	6058 256
Notice Fulfills the function of sludge separator and strainer	
Strainers see “Various system components”	
 **System water protection filter FGM050-200** For horizontal installation in return For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop Consisting of: - Filter head and bowl in brass - Magnetic insert (nickel-neodymium) - 2 pressure gauges - Very large filter surface in stainless steel - Filter fineness 200 µm - With drain valve - Connections Rp 2″ internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate (Δp < 0.1 bar): 7.2 m³/h Weight: 6.9 kg Water temperature: max. 90 °C - incl. steam diffusion-tight insulating shells	6058 257
Notice Fulfills the function of sludge separator and strainer	
Strainers see “Various system components”	
 **Vibration decoupler** for reducing structure-borne noise from heat pumps in the indoor area 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	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

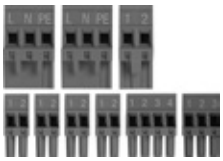
Accessories

Switching ball valve VBI60...L
DN 25-50, PN 16, 120 °C

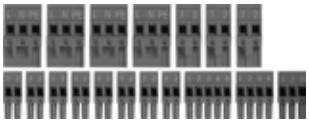
- Three-way ball valve made of brass with threaded connection
- Leakage rate: 0 ... 0.0001 % of kvs value
- Permitted media: cold water, cooling water, DHW, hot water, water with frost protection
- Recommendation: water treatment according to VDI 2035
- Media temperature: -10 ... 120 °C

DN	Connection inches	kvs m³/h	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Motor drive GLB341.9E — 2070 331
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

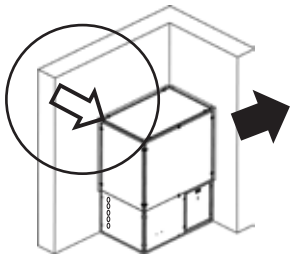


Expansion connector set — 6032 509
for the automatic heat pump device ECR461
Use for additional function:
- Flow monitor
- Crankcase bottom heating
(included in the scope of delivery for Belaria® twin A, twin AR, dual AR)
- Condensation drain heating
- Heat quantity metering
Plugs:
- 1 230 V digital input
- 2 230 V outputs
- 4 low-voltage inputs
- 1 ratio. Input
- 1 4-pin low-voltage input



Universal plug set — 6032 510
for automatic heat pump device ECR461
Plugs:
- 3 digital 230 V inputs
- 4 230 V outputs
- 6 low-voltage inputs
- 2 low-voltage outputs
- 1 ratio. input
- 1 electronic expansion valve
- 1 4-pin low-voltage input

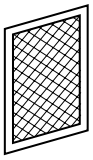
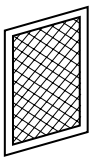
Accessories of the air ducting



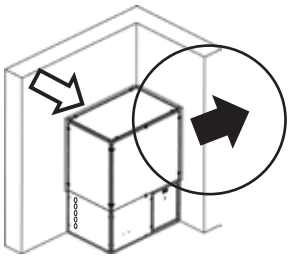
Indoor installation “standard”

Installation directly on the wall

		Part No.
	Intake	
	**Wall connection element WAE1 for suction** for Belaria® twin I/IR (20) for sealing the suction side directly on the wall black synthetic rubber, 50 mm	2033 866
	**Wall connection element WAE1 for suction** for Belaria® twin I/IR (25,30) for sealing the suction side directly on the wall black synthetic rubber, 50 mm	2033 868
	**Wall insulation 1250 x 600 x 20** for Belaria® comfort ICM (8,13), for Belaria® twin I/IR (20-30) for suction and exhaust	2076 728
	**Weatherproof grille WG1 for suction** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 for suction, made of aluminium with grilles	2033 846
	**Weatherproof grille WG1 for suction** for Belaria® twin I/IR (25,30) suitable for wall insulation 1250 x 600 x 20 for suction, made of aluminium with grilles	2033 848

		Part No.
	**Weatherproof grille WG1 sound-insulated** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 for suction, made of aluminium with grilles Reduction of sound power level 5 dB(A)	2076 723
	**Weatherproof grille WG1 sound-insulated** for Hoval Belaria® I/IR (25,30) in aluminium with blades for the suction suitable for masonry insulation and mesh grille	2076 726
	**Mesh grille MG1 for suction** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 Replaces weatherproof grille WG1 for air duct	2033 816
	**Mesh grille MG1 for suction** for Belaria® twin I/IR (25,30) suitable for wall insulation 1250 x 600 x 20 Replaces weatherproof grille WG1 for air duct	2033 818

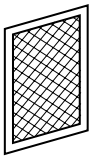
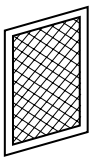
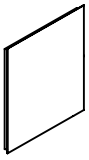
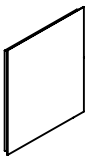
Accessories of the air ducting



Indoor installation “standard”

Installation directly on the wall

		Part No.
	Outlet	
	**Wall connection element WAE2 for exhaust** for Belaria® twin I/IR (20) black synthetic rubber, 50 mm for sealing the suction side directly on the wall	2033 871
	**Wall connection element WAE2 for exhaust** for Belaria® twin I/IR (25,30) black synthetic rubber, 50 mm for sealing the suction side directly on the wall	2033 872
	**Wall insulation 1250 x 600 x 20** for Belaria® comfort ICM (8,13), for Belaria® twin I/IR (20-30) for suction and exhaust	2076 728
	**Weatherproof grille WG2 for exhaust** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles	2033 851
	**Weatherproof grille WG2 for exhaust** for Belaria® twin I/IR (25,30) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles	2033 852

		Part No.
	**Weatherproof grille WG2 sound-insulated** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles Reduction of sound power level 5 dB(A)	2076 725
	**Weatherproof grille WG2 sound-insulated** for Belaria® twin I/IR (25,30) suitable for wall insulation 1250 x 600 x 20 for exhaust, made of aluminium with grilles Reduction of sound power level 5 dB(A)	2076 727
	**Mesh grille MG2 for exhaust** for Belaria® twin I/IR (20) suitable for wall insulation 1250 x 600 x 20 Replaces weatherproof grille WG2 for air duct	2033 821
	**Mesh grille MG2 for exhaust** for Belaria® twin I/IR (25,30) suitable for wall insulation 1250 x 600 x 20 Replaces weatherproof grille WG2 for air duct	2033 822
	**Side panel** for Belaria® twin I/IR (20) Side wall for covering the exhaust opening on the side. Required if the exhaust is upwards or if on-site air ducts are used.	6020 596
	**Side panel** for Belaria® twin I/IR (25,30) Side wall for covering the exhaust opening on the side. Required if the exhaust is upwards or if on-site air ducts are used.	6020 595
	Installation with cold ambient temperature *Necessary for heating room temperatures < 10 °C*	
	**Crankcase heater** for Belaria® twin I/IR (20-30), Thermalia® comfort (8-17), Thermalia® comfort H (7,10), Thermalia® twin (20-42), Thermalia® twin H (13-22) Necessary for heating room temperatures < 10 °C for protecting the compressor For Belaria® twin I/IR 2 pieces are necessary	6019 718

Part No.

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® twin I

Type		(20)		(25)		(30)	
		1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
• Energy efficiency class of the compound system with control	35 °C/55 °C	A++/A+		A++/A+		A++/A+	
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	153		152		150	
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	111		111		112	
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	3.9/2.6		3.9/2.9		3.8/2.9	
Max. performance data heating in acc. with EN 14511							
• Heat output A2W35	kW [3)]	10.4	20.8	12.5	25.0	15.2	30.4
• Coefficient of performance A2W35	COP	3.9	3.5	3.9	3.5	3.8	3.4
• Heat output A-7W35	kW [3)]	8.8	17.6	9.4	20.8	5.9	24.4
• Coefficient of performance A-7W35	COP	3.4	3.1	2.8	3.0	1.9	3.1
Sound data							
• Sound power level EN 12102 (inside)	dB(A)	58		60		61	
• Sound power level EN 12102 (outlet) [4)]	dB(A)	64		66		67	
• Sound pressure level 5 m	dB(A)	45		47		48	
• Sound pressure level 10 m	dB(A)	39		41		42	
Hydraulic data							
• Max. flow temperature	°C	55		55		55	
• Max. operating pressure on the heating side	bar	6		6		6	
• Flow/return connection heating	R (ext. thread)	1¼″		1½″		1½″	
• Pressure drop heat pump	kPa	15		17		15	
• Nominal heating water quantity	m^3/h	4.5		4.9		5.1	
• Nominal air volume	m^3/h	3000-6000		3800-7500		4500-9000	
• Externally available pressure	Pa	200		200		200	
• Max. speed in air ducts	m/s	4		4		4	
Cooling technical data							
• Refrigerant		R407C		R407C		R407C	
• Compressor/stages		2/2		2/2		2/2	
• Refrigerant filling quantity	kg	11.3		12.5		13.0	
• Compressor oil filling quantity	l	1.9		1.9		1.9	
Electrical data							
• Electrical connection compressor	V/Hz	3~400/50		3~400/50		3~400/50	
• Electrical connection fan	V/Hz	3~400/50		3~400/50		3~400/50	
• Electrical connection control	V/Hz	1~230/50		1~230/50		1~230/50	
• Max. heat pump operating current	A	14.6		17.9		21.9	
• Compressor power consumption A2W35	kW	2.7	5.9	3.2	7.1	4.0	8.9
• Compressor power consumption A20W55	kW	4.1	9.1	5.2	11.5	5.8	12.8
• Max. starting current heat pump (with jump start)	A	24.2		29.7		35.1	
• External protection main current	A	16		20		25	
• External protection main current	Type	C,D,K		C,D,K		C,D,K	
• External protection control current	A	13		13		13	
• External protection control current	Type	B,C,D,K,Z		B,C,D,K,Z		B,C,D,K,Z	
Dimensions/weight							
• Dimensions (H x W x D)	mm	1735 x 1200 x 880		1935 x 1300 x 980		1935 x 1300 x 980	
• Weight	kg	400		455		485	

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = incl. defrosting loss

[4)] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

Using a fault-current circuit breaker RCCB type B. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

Belaria® twin IR

Type		(20)		(25)		(30)	
		1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
• Energy efficiency class of the compound system with control	35 °C/55 °C	A++/A+		A++/A+		A++/A+	
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	155		153		151	
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	112		112		113	
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	3.9/2.6		3.9/2.9		3.8/2.9	
Max. performance data heating and cooling in acc. with EN 14511							
• Heat output A2W35	kW [3)]	10.4	20.8	12.5	25.0	15.2	30.4
• Coefficient of performance A2W35	COP	3.9	3.5	3.9	3.5	3.8	3.4
• Heat output A-7W35	kW [3)]	8.8	17.6	9.4	20.8	5.9	24.4
• Coefficient of performance A-7W35	COP	3.4	3.1	2.8	3.0	1.9	3.1
• Cooling capacity A35W18	kW	14.3	26.6	15.8	30.3	19.0	35.5
• Energy efficiency ratio A35W18	EER	3.6	3.1	3.4	3.0	3.3	2.9
• Cooling capacity A35W7	kW	10.2	19.0	10.8	22.0	13.2	24.7
• Energy efficiency ratio A35W7	EER	2.8	2.5	2.6	2.4	2.6	2.3
Sound data							
• Sound power level EN 12102 (inside)	dB(A)	58		60		61	
• Sound power level EN 12102 (outlet) [4)]	dB(A)	63		65		66	
• Sound pressure level 5 m	dB(A)	44		46		47	
• Sound pressure level 10 m	dB(A)	38		40		41	
Hydraulic data							
• Max. flow temperature	°C	55		55		55	
• Max. operating pressure on the heating side	bar			6			
• Flow/return connection heating	R (ext. thread)	1¼″		1½″		1½″	
• Pressure drop heat pump	kPa	15		17		15	
• Nominal heating water quantity	m^3/h	4.5		4.9		5.1	
• Nominal air volume	m^3/h	3000-6000		3800-7500		4500-9000	
• Externally available pressure	Pa	200		200		200	
• Max. speed in air ducts	m/s	4		4		4	
Cooling technical data							
• Refrigerant		R407C		R407C		R407C	
• Compressor/stages		2/2		2/2		2/2	
• Refrigerant filling quantity	kg	13.0		18.3		19.8	
• Compressor oil filling quantity	l	1.9		1.9		1.9	
Electrical data							
• Electrical connection compressor	V/Hz	3~400/50		3~400/50		3~400/50	
• Electrical connection fan	V/Hz	3~400/50		3~400/50		3~400/50	
• Electrical connection control	V/Hz	1~230/50		1~230/50		1~230/50	
• Max. heat pump operating current	A	14.6		17.9		21.9	
• Compressor power consumption A2W35	kW	2.7		3.2		4.0	
• Compressor power consumption A20W55	kW	4.1		5.2		5.8	
• Max. starting current heat pump (with jump start)	A	24.2		29.7		35.1	
• External protection main current	A	16		20		25	
• External protection main current	Type	C,D,K		C,D,K		C,D,K	
• External protection control current	A	13		13		13	
• External protection control current	Type	B,C,D,K,Z		B,C,D,K,Z		B,C,D,K,Z	
Dimensions/weight							
• Dimensions (H x W x D)	mm	1735 x 1200 x 880		1935 x 1300 x 980		1935 x 1300 x 980	
• Weight	kg	400		455		485	

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

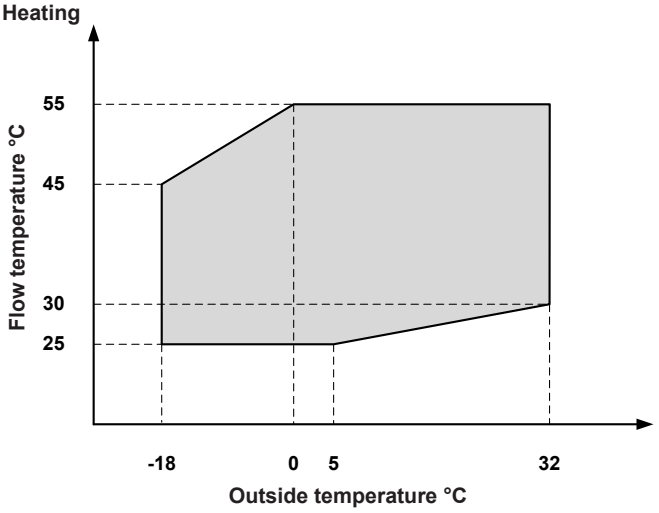
[3)] kW = incl. defrosting loss

[4)] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

Using a fault-current circuit breaker RCCB type B. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

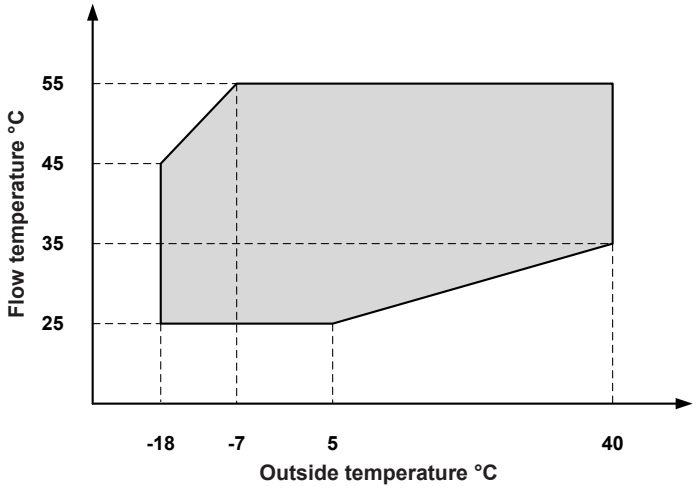
Diagrams of areas of application

Belaria® twin I (20-30), Belaria® twin IR (20-30)
Heating



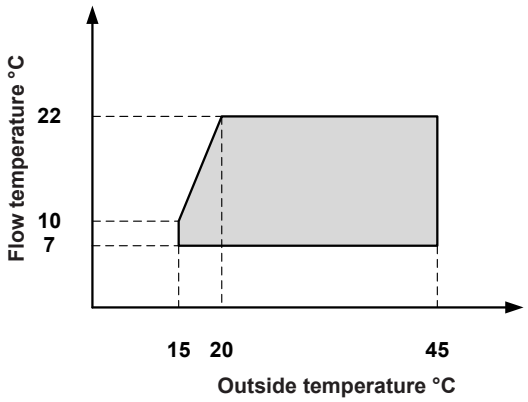
Area of application of the heat pump for heating

Belaria® twin I (20-30), Belaria® twin IR (20-30)
Hot water



Area of application of the heat pump for domestic hot water

Belaria® twin IR (20-30)
Cooling



Area of application of the heat pump for cooling

Belaria® twin I, twin IR (20-30)

Sound pressure level - sound power level
The **sound pressure level** is dependent on the **place of measurement** in a sound field and describes the sound intensity at this place. The sound power level thus is a feature of the sound source and therefore is distance-unrelated; it describes the totality of sound power of the relevant source radiated into all directions.

The effective sound pressure in the installation room depends on various factors such as room size, absorption capacity, reflection, free sound propagation etc.
For this reason, it is important to ensure that where possible, the boiler room is outside noise-sensitive areas of the building and equipped with a sound-absorbing door.

Belaria® twin I, twin IR		(20)		(25)		(30)	
Stage		1	2	1	2	1	2
Sound power level in the installation room	dB(A)	55	58	57	60	58	61

Outlet and intake directly through the wall
The sound pressure levels indicated below apply if the air intake and outlet are positioned across a corner from each other on a straight wall without roofing.

Belaria® twin I		(20)		(25)		(30)	
		1	2	1	2	1	2
Sound power level [1]	dB(A)	60	64	62	66	63	67
Sound pressure level 5 m [1]	dB(A)	41	45	43	47	44	48
Sound pressure level 10 m [1]	dB(A)	35	39	37	41	38	42

Belaria® twin IR		(20)		(25)		(30)	
		1	2	1	2	1	2
Sound power level [1]	dB(A)	60	63	62	65	63	66
Sound pressure level 5 m [1]	dB(A)	41	45	43	47	44	48
Sound pressure level 10 m [1]	dB(A)	35	39	37	41	38	42

[1] Information on sound levels applies to whisper mode.
Values increase by + 4 dB(A) in normal operation

Reduced sound levels (outside) as a result of the installation situation

The following reductions in the sound levels can be assumed as a result of the installation of the following components in the air duct:

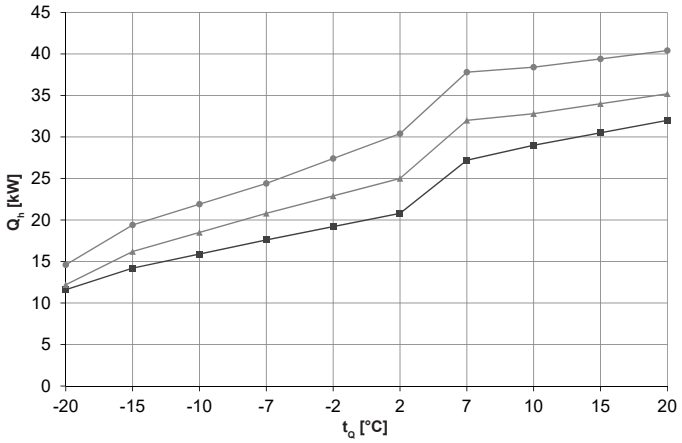
- Light well from a depth of 1.5 m: - 4 dB(A)
- Air duct insulated on the inside with 90° elbow, L < 2 m: - 6 dB(A)
- Air duct insulated on the inside with 90° elbow, L > 2 m: - 8 dB(A)

Performance data - heating

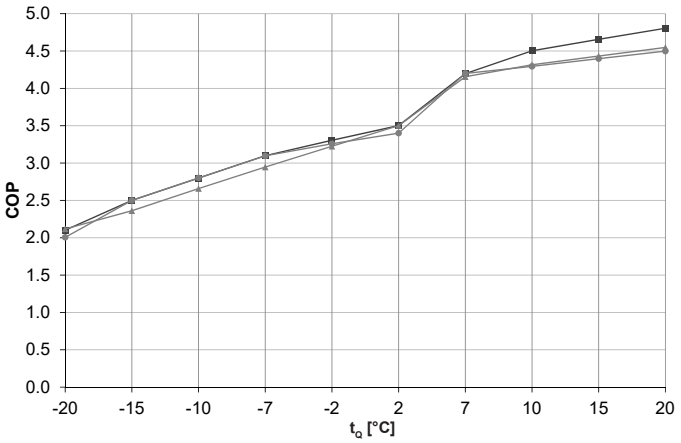
Maximum heat output allowing for defrosting losses

Belaria® twin I (20-30), twin IR (20-30)

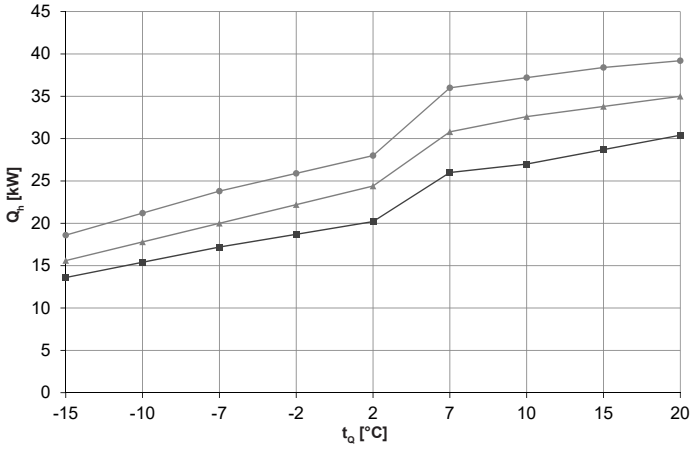
Heat output - t_{VL} 35 °C



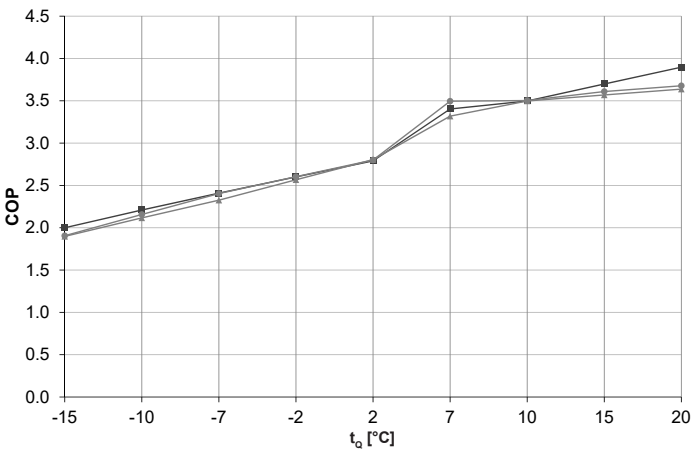
Coefficient of performance - t_{VL} 35 °C



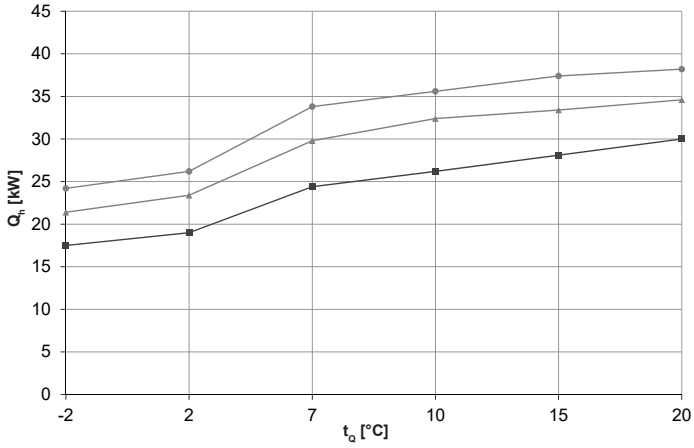
Heat output - t_{VL} 45 °C



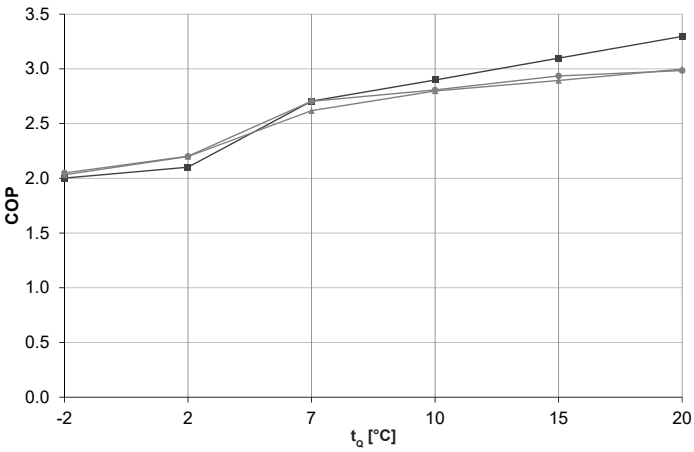
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



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

Belaria® twin I/IR (20)
Belaria® twin I/IR (25)
Belaria® twin I/IR (30)

Performance data - heating

Belaria® twin I (20-30), twin IR (20-30)

Indications acc. to EN 14511

t_{VL} °C	t_Q °C	Q_h kW	(20) P kW	COP	Q_h kW	(25) P kW	COP	Q_h kW	(30) P kW	COP
35	-20	11.6	5.5	2.1	12.2	5.8	2.1	14.6	7.3	2.0
	-15	14.2	5.7	2.5	16.2	6.9	2.4	19.4	7.8	2.5
	-10	15.9	5.7	2.8	18.5	7.0	2.7	21.9	7.8	2.8
	-7	17.6	5.7	3.1	20.8	7.1	3.0	24.4	7.9	3.1
	-2	19.2	5.8	3.3	22.9	7.1	3.2	27.4	8.4	3.3
	2	20.8	5.9	3.5	25.0	7.1	3.5	30.4	8.9	3.4
	7	27.2	6.5	4.2	32.0	7.7	4.2	37.8	9.0	4.2
	10	29.0	6.4	4.5	32.8	7.6	4.3	38.4	8.9	4.3
	15	30.5	6.6	4.7	34.0	7.7	4.4	39.4	9.0	4.4
	20	32.0	6.7	4.8	35.2	7.7	4.6	40.4	9.0	4.5
45	-15	13.6	6.8	2.0	15.6	8.2	1.9	18.6	9.8	1.9
	-10	15.4	7.0	2.2	17.8	8.4	2.1	21.2	9.8	2.2
	-7	17.2	7.1	2.4	20.0	8.6	2.3	23.8	9.9	2.4
	-2	18.7	7.2	2.6	22.2	8.7	2.6	25.9	10.0	2.6
	2	20.2	7.2	2.8	24.4	8.7	2.8	28.0	10.0	2.8
	7	26.0	7.6	3.4	30.8	9.3	3.3	36.0	10.3	3.5
	10	27.0	7.7	3.5	32.6	9.3	3.5	37.2	10.6	3.5
	15	28.7	7.8	3.7	33.8	9.5	3.6	38.4	10.6	3.6
	20	30.4	7.8	3.9	35.0	9.6	3.6	39.2	10.7	3.7
55	-2	17.5	8.7	2.0	21.4	10.5	2.0	24.2	11.8	2.1
	2	19.0	9.0	2.1	23.4	10.6	2.2	26.2	11.9	2.2
	7	24.4	9.0	2.7	29.8	11.4	2.6	33.8	12.5	2.7
	10	26.2	9.0	2.9	32.4	11.6	2.8	35.6	12.7	2.8
	15	28.1	9.1	3.1	33.4	11.5	2.9	37.4	12.7	2.9
	20	30.0	9.1	3.3	34.6	11.5	3.0	38.2	12.8	3.0

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

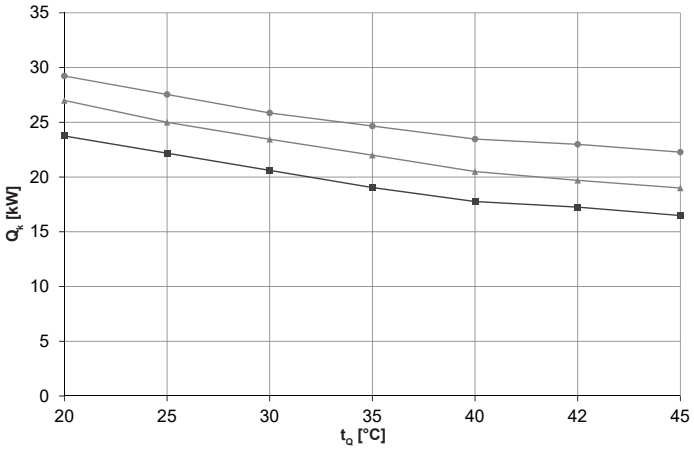
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - cooling

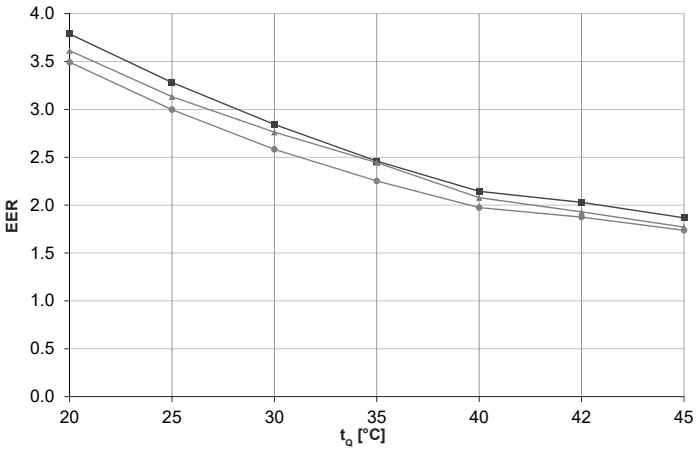
Maximum cooling capacity

Belaria® twin IR (20-30)

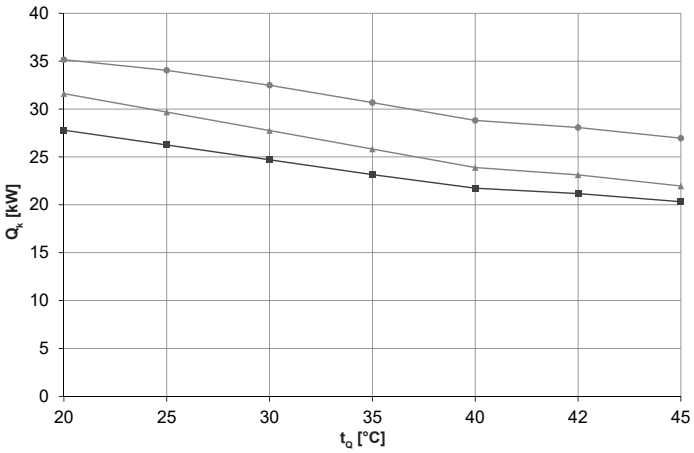
Cooling capacity - t_{VL} 7 °C



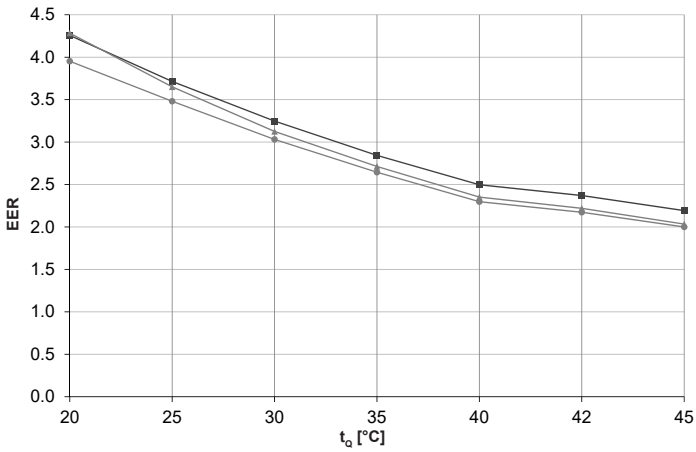
Energy efficiency ratio - t_{VL} 7 °C



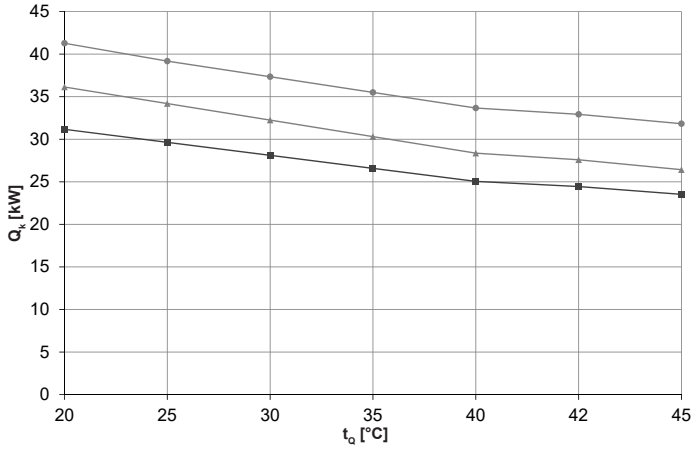
Cooling capacity - t_{VL} 13 °C



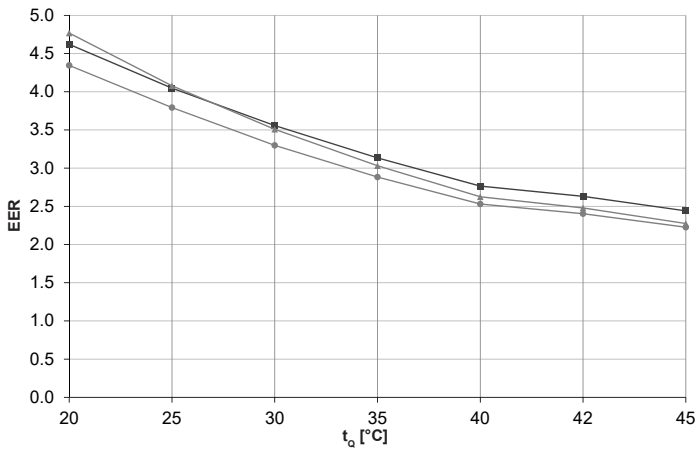
Energy efficiency ratio - t_{VL} 13 °C



Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °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

Belaria® twin IR (20)
Belaria® twin IR (25)
Belaria® twin IR (30)

Performance data - cooling

Belaria® twin IR (20-30)

Indications acc. to EN 14511

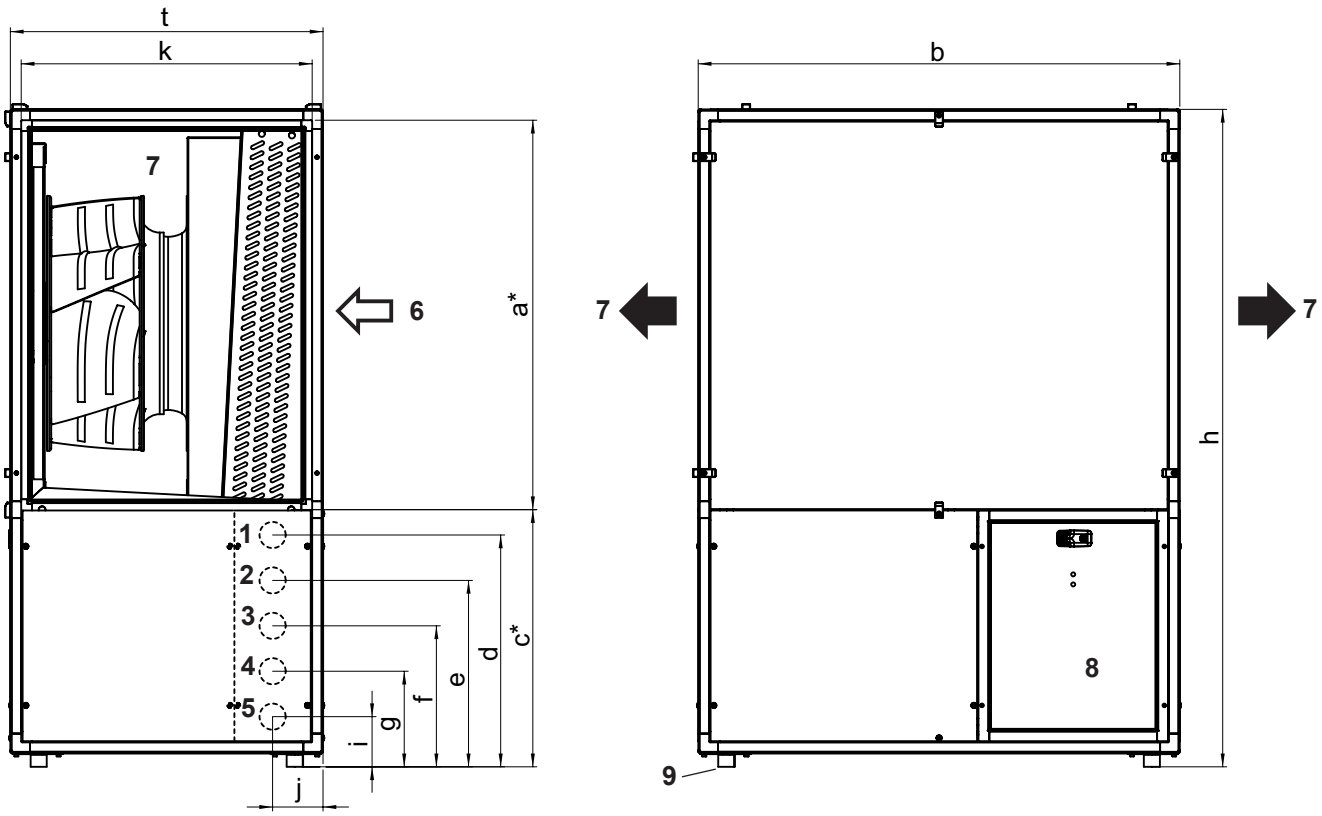
		(20)			(25)			(30)		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER	Q_k kW	P kW	EER
	20	23.8	6.3	3.8	27.0	7.5	3.6	29.2	8.4	3.5
	25	22.2	6.8	3.3	25.0	8.0	3.1	27.5	9.2	3.0
	30	20.6	7.3	2.8	23.5	8.5	2.8	25.9	10.0	2.6
7	35	19.0	7.7	2.5	22.0	9.0	2.4	24.7	10.9	2.3
	40	17.8	8.3	2.1	20.5	9.9	2.1	23.5	11.9	2.0
	42	17.3	8.5	2.0	19.7	10.2	1.9	23.0	12.3	1.9
	45	16.5	8.8	1.9	19.0	10.7	1.8	22.3	12.8	1.7
	20	25.8	6.4	4.0	29.3	7.0	4.2	32.3	8.8	3.7
	25	24.2	6.9	3.5	27.4	7.9	3.5	31.2	9.5	3.3
	30	22.6	7.4	3.0	25.5	8.7	2.9	28.9	10.4	2.8
10	35	21.1	7.9	2.7	23.6	9.3	2.5	27.5	11.3	2.4
	40	19.7	8.5	2.3	21.7	9.9	2.2	26.1	12.2	2.1
	42	19.2	8.7	2.2	21.0	10.1	2.1	25.5	12.6	2.0
	45	18.4	9.0	2.0	19.8	10.5	1.9	24.6	13.1	1.9
	20	27.8	6.5	4.3	31.6	7.4	4.3	35.2	8.9	4.0
	25	26.2	7.1	3.7	29.7	8.1	3.7	34.0	9.8	3.5
	30	24.7	7.6	3.3	27.8	8.9	3.1	32.5	10.7	3.0
13	35	23.2	8.1	2.8	25.8	9.5	2.7	30.7	11.6	2.6
	40	21.7	8.7	2.5	23.9	10.2	2.4	28.8	12.5	2.3
	42	21.2	8.9	2.4	23.1	10.4	2.2	28.1	12.9	2.2
	45	20.3	9.3	2.2	22.0	10.8	2.0	27.0	13.5	2.0
	20	29.1	6.6	4.4	33.9	7.7	4.4	37.1	8.9	4.2
	25	27.6	7.2	3.9	32.0	8.4	3.8	36.0	9.9	3.6
	30	26.1	7.7	3.4	30.0	9.1	3.3	34.9	11.0	3.2
15	35	24.5	8.3	3.0	28.0	9.8	2.9	32.8	11.8	2.8
	40	23.1	8.8	2.6	26.1	10.4	2.5	30.7	12.8	2.4
	42	22.5	9.1	2.5	25.3	10.7	2.4	29.8	13.2	2.3
	45	21.6	9.4	2.3	24.1	11.1	2.2	28.5	13.7	2.1
	20	31.2	6.7	4.6	36.1	7.6	4.8	41.3	9.5	4.4
	25	29.6	7.3	4.1	34.2	8.4	4.1	39.2	10.3	3.8
	30	28.1	7.9	3.6	32.3	9.2	3.5	37.3	11.3	3.3
18	35	26.6	8.5	3.1	30.3	10.0	3.0	35.5	12.3	2.9
	40	25.1	9.1	2.8	28.4	10.8	2.6	33.7	13.3	2.5
	42	24.4	9.3	2.6	27.6	11.1	2.5	32.9	13.7	2.4
	45	23.5	9.6	2.4	26.4	11.6	2.3	31.8	14.3	2.2
	20	32.9	6.9	4.8	38.4	8.1	4.7	46.2	9.5	4.9
	25	31.3	7.5	4.2	36.2	8.8	4.1	43.5	10.5	4.1
	30	29.7	8.1	3.7	33.9	9.5	3.6	40.7	11.5	3.5
20	35	28.2	8.6	3.3	31.6	10.1	3.1	37.9	12.6	3.0
	40	26.6	9.2	2.9	29.7	10.9	2.7	35.2	13.6	2.6
	42	25.9	9.5	2.7	28.9	11.2	2.6	34.0	14.0	2.4
	45	25.0	9.8	2.6	27.7	11.5	2.4	32.4	14.6	2.2
	20	34.7	7.1	4.9	38.8	8.2	4.8	47.8	9.5	5.0
	25	33.0	7.7	4.3	36.8	8.9	4.2	45.3	10.6	4.3
	30	31.4	8.2	3.8	34.9	9.6	3.7	42.9	11.7	3.7
22	35	29.7	8.8	3.4	32.9	10.3	3.2	40.4	12.8	3.2
	40	28.1	9.4	3.0	31.0	10.9	2.8	37.9	13.9	2.7
	42	27.4	9.6	2.9	30.2	11.2	2.7	36.9	14.3	2.6
	45	26.4	10.0	2.7	29.0	11.6	2.5	35.4	15.0	2.4

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 of the 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® twin I (20-30), Belaria® twin IR (20-30)

(Dimensions in mm)



1 Heating flow with flexible connection hose
Belaria® twin I, Belaria® twin IR (20): R 1¼″;
Belaria® twin I, Belaria® twin IR (25,30): R 1½″

2 For sensor/control lines

3 For sensor/control lines

4 Heating return with flexible connection hose
Belaria® twin I, Belaria® twin IR (20): R 1¼″;
Belaria® twin I, Belaria® twin IR (25,30): R 1½″

5 Condensate drain with flexible connection hose 1″.
An airtight siphon with a minimum height of 100 mm must be installed in the condensate line on site!

6 Air intake (evaporator inlet)
Connection directly on the plastic frame (2 mm thick)

7 Air outlet opening, panels removable
Outlet directions: optionally towards the left or right side (repositioning on-site)
Accessories for “Flex” indoor installation:
Blow-off panel with air hose connection plate.

8 Electrical box and terminal box/TopTronic® E controller and operating switch

9 Adjustable feet, see dimension h ± 8 mm
(Axis dimension from outside 90 mm)
- Level heat pump horizontally

Belaria® twin I, Belaria® twin IR	b	h	a	c	d	e	f	g	i	j	k	t
(20)	1200	1735	965	740	675	540	400	260	125	125	820	880
(25,30)	1300	1935	1165	740	675	540	400	260	125	125	920	980

* Dimensions of the divided version of the Belaria® twin I, twin IR (20-30) (only available in Switzerland)

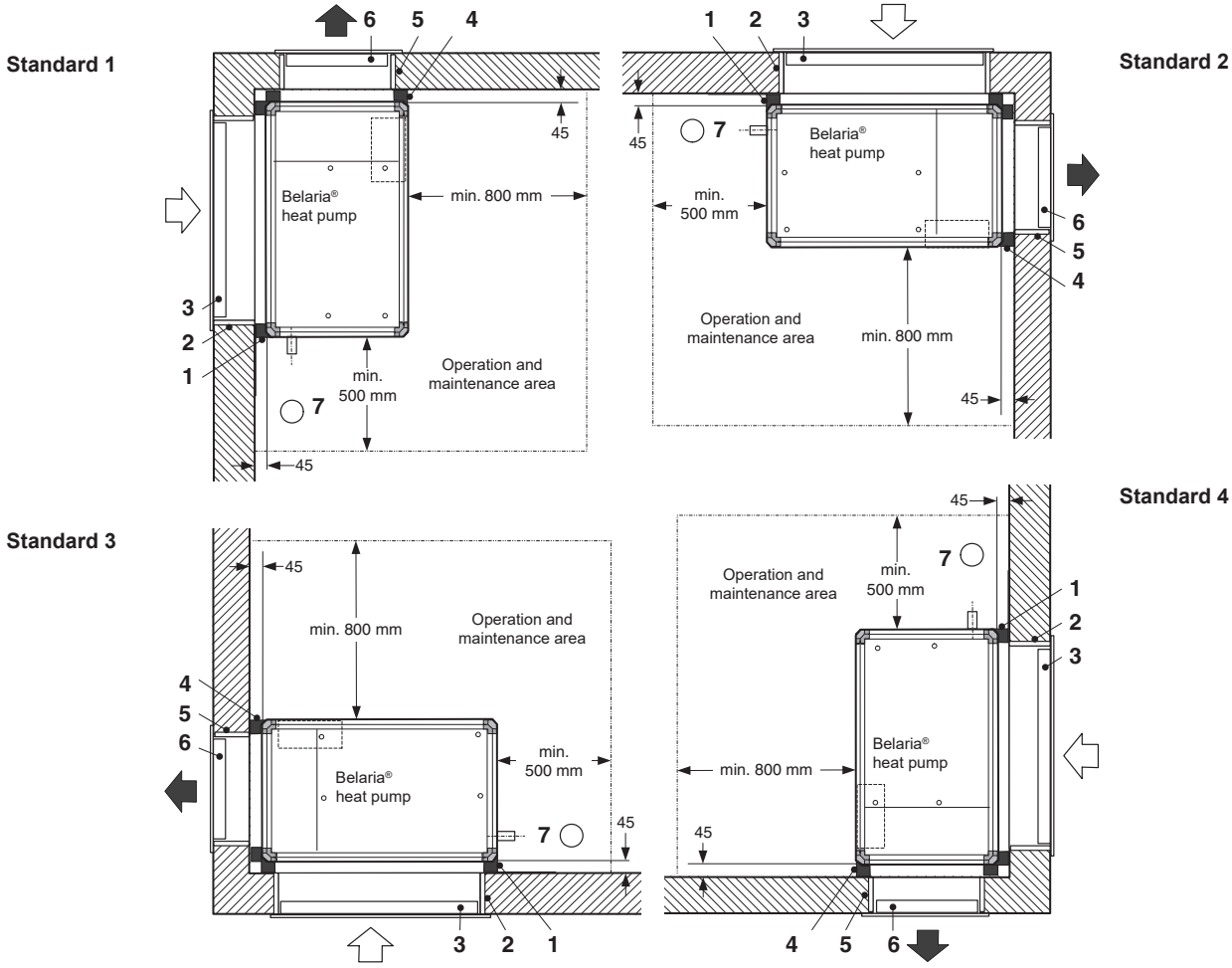
Space requirement “standard” installation with wall insulation MI

“Standard” installation with wall insulation MI
Installation in the corner of the boiler room, directly on the outer wall, with wall connection element and weatherproof grille. Intake at the back, outlet to the right (preferred) or to the left. Water connections on the opposite side.

Cut-outs
The cut-outs must be created professionally and without cold bridges!
The dimensions of the cut-outs are “clear dimensions” measured from the finished floor!

Air ducts
Concrete ducts have unfavourable acoustic properties and often magnify sound emissions. It is therefore advisable to equip the air ducts with a sound-absorbing, weatherproof lining. The air ducts must be drained.

Outlet to the right



Belaria® twin I (20-30), Belaria® twin IR (20-30)		Application	Accessories type
Heat pump		Indoor installation	
1	Wall connection element	Intake	WAE1
2	Wall insulation	Intake	MI1
3	Weatherproof grille	Intake	WG1
3	Weatherproof grille sound-insulated	Intake	WG1
4	Wall connection element	Outlet	WAE2
5	Wall insulation	Outlet	MI2
6	Weatherproof grille	Outlet	WG2
6	Weatherproof grille sound-insulated	Outlet	WG2
7	Condensate drain (on site, siphon height approx.100 mm)		

Space requirement “standard” installation with wall insulation MI

“Standard” installation with wall insulation MI
Installation in the corner of the boiler room, directly on the outer wall, with wall connection element and weatherproof grille. Intake at the back, outlet to the right (preferred) or to the left. Water connections on the opposite side.

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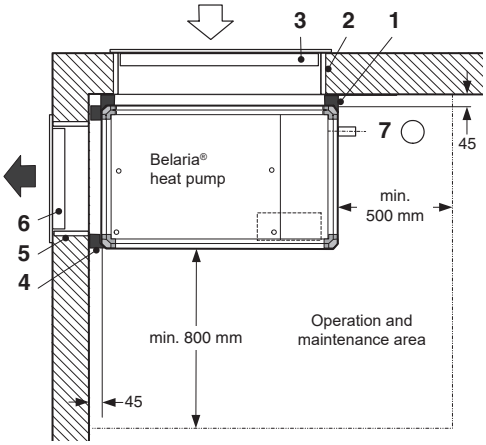
Air ducts
Concrete ducts have unfavourable acoustic properties and often magnify sound emissions. It is therefore advisable to equip the air ducts with a sound-absorbing, weatherproof lining. The air ducts must be drained.

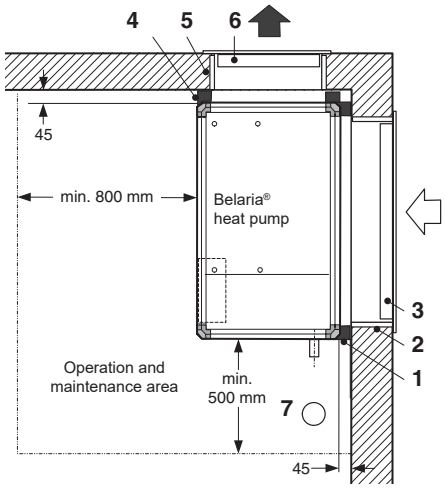
The blow-off opening on the right side should be preferred as a result of accessibility for service!

Outlet to the left

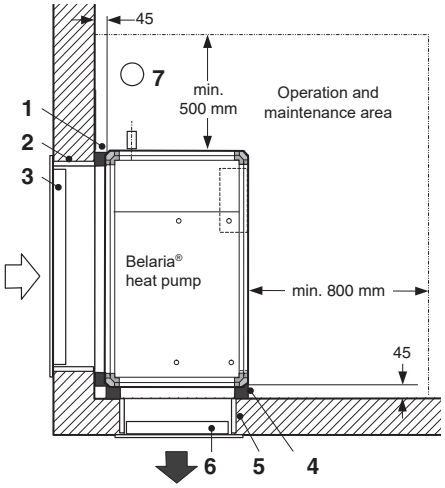
Standard 5



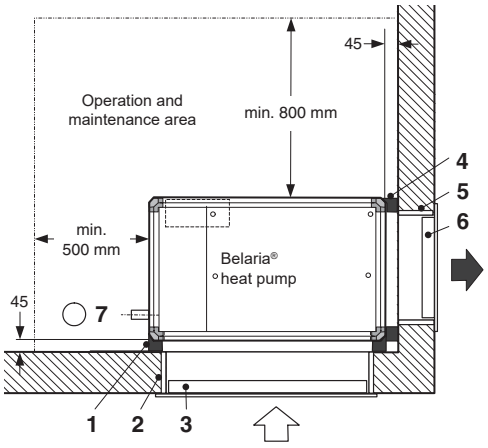
Standard 6



Standard 7



Standard 8

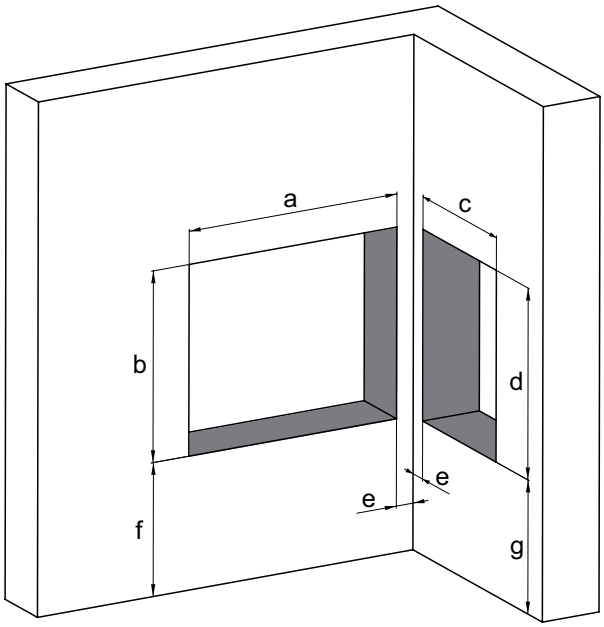


Belaria® twin I (20-30), Belaria® twin IR (20-30)		Application	Accessories type
Heat pump		Indoor installation	
1	Wall connection element	Intake	WAE1
2	Wall insulation	Intake	MI1
3	Weatherproof grille	Intake	WG1
3	Weatherproof grille sound-insulated	Intake	WG1
4	Wall connection element	Outlet	WAE2
5	Wall insulation	Outlet	MI2
6	Weatherproof grille	Outlet	WG2
6	Weatherproof grille sound-insulated	Outlet	WG2
7	Condensate drain (on site, siphon height approx.100 mm)		

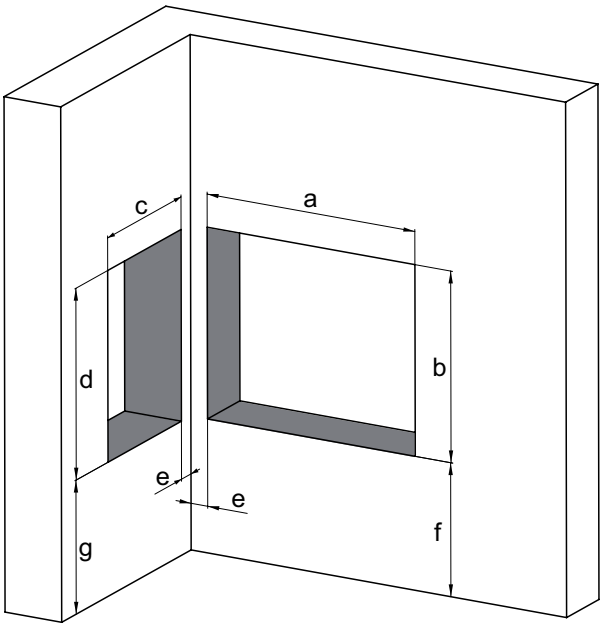
Space requirement “standard” installation with wall insulation MI

Cut-out dimensions
“Standard” installations - heat pump in the corner, without air ducts, with wall insulation MI
(Dimensions in mm)
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of finished floor

Standard installation 1–4
Air outlet to the right
Preferred solution due to ease of access for servicing

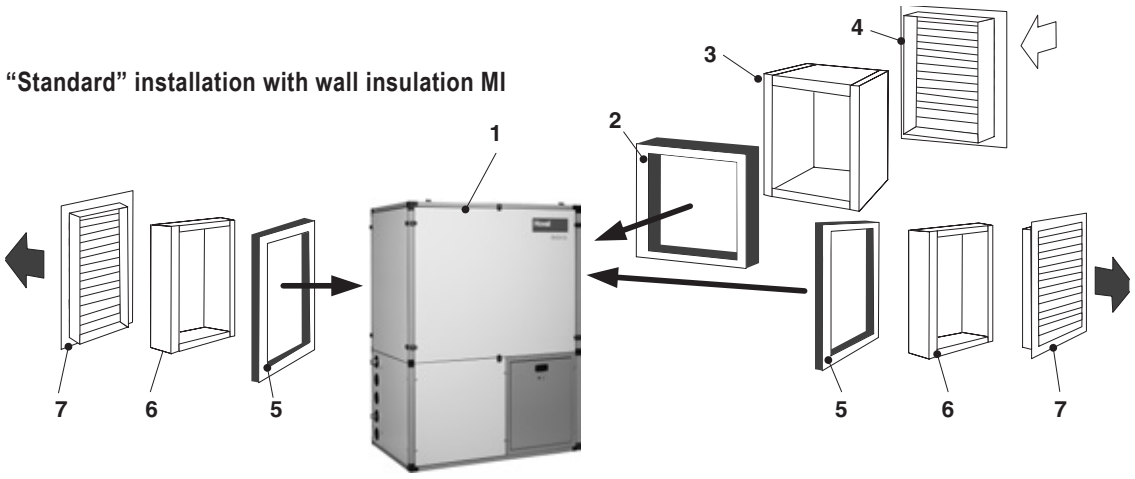


Standard installation 5–8
Air outlet to the left



Belaria® twin I, Belaria® twin IR	Cut-out dimensions						
	a	b	c	d	e	f	g
(20)	1140	950	820	950	70	740	740
(25,30)	1240	1150	920	1150	70	740	740

“Standard” installation with wall insulation MI



1 Heat pump
Intake
2 Wall connection element
3 Wall insulation (20 mm)
4 Weatherproof grille
4 Weatherproof grille sound-insulated

Outlet
5 Wall connection element
6 Wall insulation (20 mm)
7 Weatherproof grille
7 Weatherproof grille sound-insulated

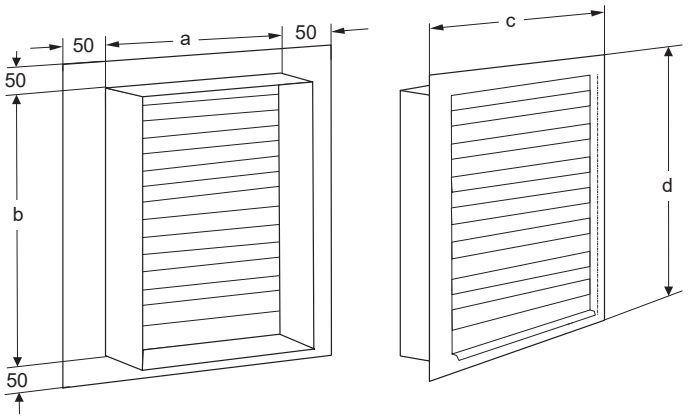
Weatherproof grille

(Dimensions in mm)

Weatherproof grille made from aluminium with mesh grille.

For the cut-outs with wall insulation type MI-E01 (intake) or MI-A01, MI-A02 (outlet).

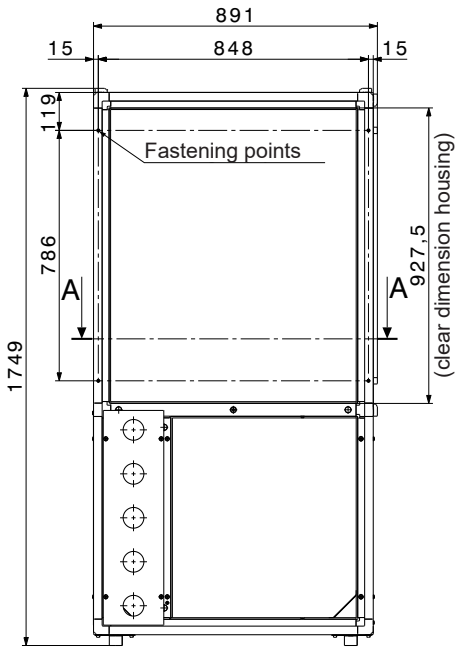
If the thermal insulation for the wall openings is provided on-site, it must be 20 mm thick!

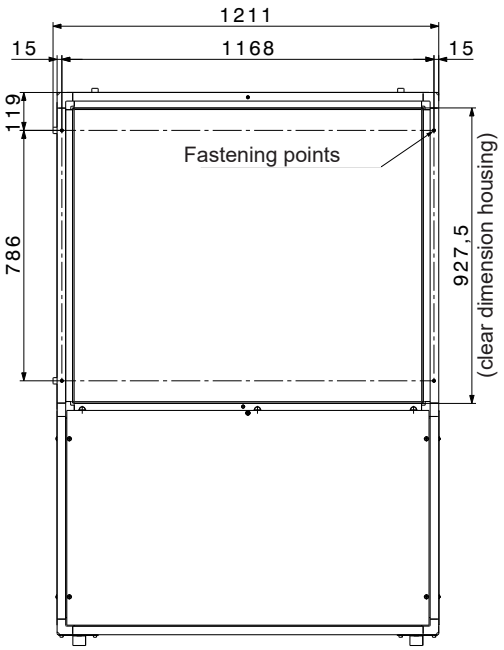


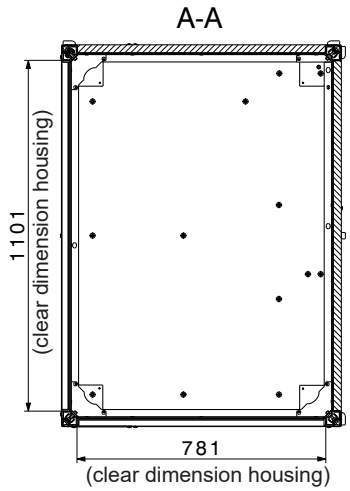
Weatherproof grille type	Belaria® twin I, Belaria® twin IR type	Application for	a	b	c	d
WG1	(20)	Intake	1100	900	1180	1000
WG1	(25,30)	Intake	1200	1100	1280	1200
WG2	(20)	Outlet	780	900	860	1000
WG2	(25,30)	Outlet	880	1100	960	1200

Clear dimensions Belaria® twin I (20), Belaria® twin IR (20)

(Dimensions in mm)

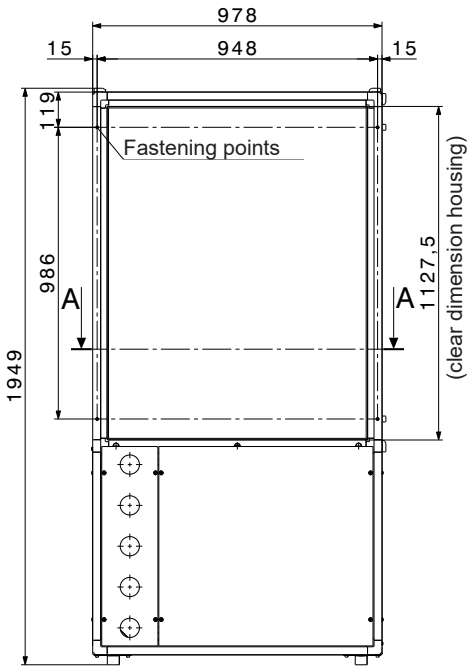


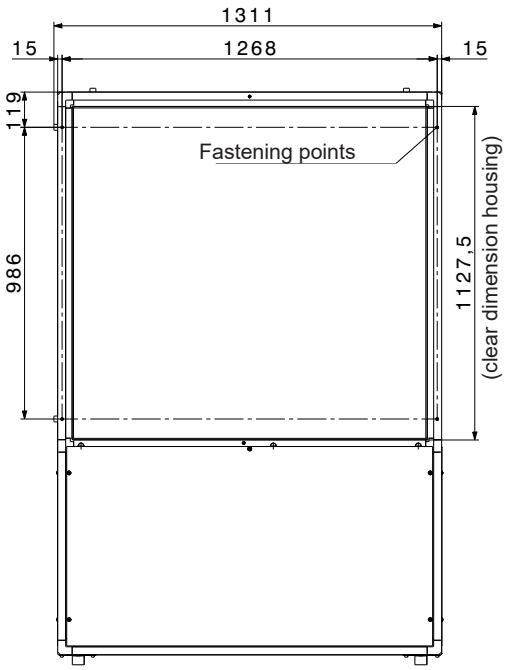


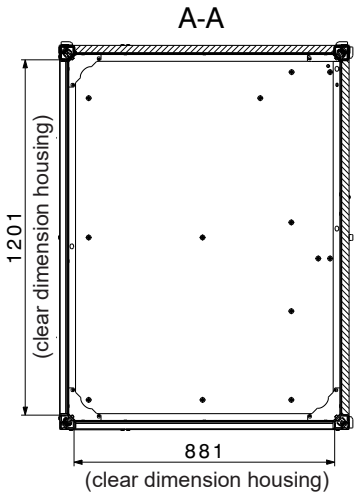


Clear dimensions Belaria® twin I (25,30), Belaria® twin IR (25,30)

(Dimensions in mm)







Hoval Belaria® twin A
Hoval Belaria® twin AR
Air/water heat pump

- Compact air/water heat pump for outside installation
- High energy efficiency
- Evaporator and refrigeration part are placed adjacent to one another. The refrigeration part is encapsulated with electrolytically galvanised, powder-coated and sound-insulated steel sheets. Colour light grey (RAL 7035).
- Covering made of sheet steel, colour anthracite (DB 703)
- Two suction gas cooled scroll compressors.
- With large-area, multi-row aluminium/copper ribbed pipe evaporator and copper-brazed plate-type condenser made from stainless steel
- Two electronic expansion valves for the highest efficiency and operational reliability
- Speed-controlled axial ventilator made from high-strength composite material with vanes as a compact unit for low energy consumption and the lowest noise level
- Two electronic starting current limiters with rotary field/phase monitoring
- Belaria® twin AR - additionally with cooling function through inversion of cycle
- Filled with refrigerant R410A, wired up internally ready for connection
- Electrical box for wall mounting inside the building with built-in TopTronic® E controller
- The electrical box is not included in the scope of delivery and must be ordered in addition as an accessory.
- Strainer ball valve installed
- Connecting hoses included
  Heating side pipework in the casing

Condensate connection
- The drain pipeline is to be made with sufficient incline and without change of the cross-section.
- The water connections and the drain pipelines must be carried out outdoors and must be protected against frost on site (see base plan).

Hydraulic connections
- Heating connections with flexible hoses to the bottom

Electrical connections
- Connection from the bottom (see base plan)

Options
- Diffuser for sound reduction

TopTronic® E controller

Control panel
- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

TopTronic® E control module
- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules

Model range

Belaria® twin A type			Heat output A2W35 kW		Belaria® twin AR type			Heat output A2W35 kW		Cooling capacity A35W18 kW	
	35 °C	55 °C	stage 1	stage 2		35 °C	55 °C	stage 1	stage 2	stage 1	stage 2
(32)	A+++	A++	18.6	31.6	(32)	A+++	A++	18.6	31.6	22.7	40.4

Energy efficiency class of the compound system with control.

- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

TopTronic® E basic module heat generator TTE-WEZ
- Control functions integrated 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 heat balancing or
  - module expansion Universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

Number of modules that can be additionally installed in the electrical box:
- 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.

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
One-piece design. Compact unit wired-up internally ready for connection.

Recommended accessories
- High-efficiency pump with continuously variable speed control

Air/water heat pump - 2-stage

Hoval Belaria® twin A

Belaria® twin A type	Heat output A2W35 kW		Part No.
	stage 1	stage 2	
(32)	18.6	31.6	7016 821

Air/water heat pump - 2-stage (cooling function)

Hoval Belaria® twin AR

Belaria® twin AR type	Heat output A2W35 kW		Cooling capacity A35W18 kW		Part No.
	stage 1	stage 2	stage 1	stage 2	
(32)	18.6	31.6	22.7	40.4	7016 824

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

Further information
see “Description”

Notice
Suitable charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0-10 V or PWM1

Premium pump Stratos
with IF module Stratos Ext. Off (0-10 V)

See “Circulating pumps”

The electrical box with built-in TopTronic® E controller must be ordered separately.

If the heat pump is ordered without electrical box, engineering must absolutely be performed by Hoval, otherwise it will not be taken into operation.

Electric heating elements
see “Calorifiers” - chapter “Electric heating elements”

Energy efficiency class
see Description

Notice
A buffer storage tank must be provided.

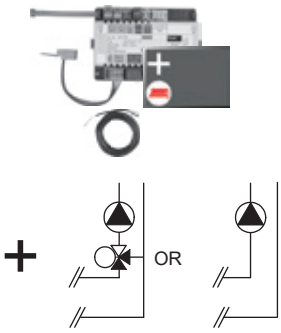
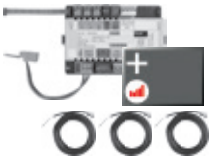
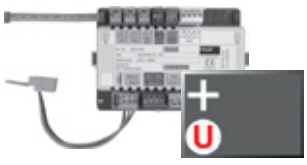
Matching buffer storage tanks
see “Calorifiers”

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
	**Set vibration-damping adjustable feet 55/65** for Belaria® twin A/AR (32) for reducing the transmission of solid-borne noise Set comprises 4 vibration-damping adjustable feet, threaded rot and locknut Material elastomer part: NR, black Material housing: galvanised steel, chromated	6040 348
	Recommended accessory: **High-efficiency pump with continuously variable speed control**	

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
	**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!	6034 576
	**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.	6037 062
	**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” - “Hoval TopTronic® E module expansions” chapter **Notice** Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.	6034 575

Accessories

Flow rate sensor sets
Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 8	G ¾″	0.9-15	6038 526
DN 10	G ¾″	1.8-32	6038 507
DN 15	G 1″	3.5-50	6038 508
DN 20	G 1¼″	5-85	6038 509
DN 25	G 1½″	9-150	6038 510

Brass housing

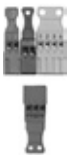
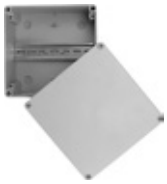
Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950
DN 40	G 2″	22-400	6055 092

Hoval recommended use
Flow rate sensor set DN 32 made of brass.
Installation location within the heat pump.

Recommended accessories:
speed-controlled high-efficiency pump
see “Circulating pumps”

Notice
Installation of a flow rate sensor set is recommended. With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented.
In order to protect the heat pump from frost in the event of a power failure or for example in bivalence mode, a system separation or other technical measures must be provided on site.

Accessories for TopTronic® E

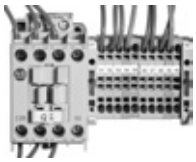
		Part No.
	**TopTronic® E controller modules**	
TTE-HK/WW	TopTronic® E heating circuit/ hot water module	6034 571
TTE-SOL	TopTronic® E solar module	6037 058
TTE-PS	TopTronic® E buffer module	6037 057
TTE-MWA	TopTronic® E measuring module	6034 574
	**Supplementary plug set**	
	for basic module heat generator 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
	**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
	**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

Trace heating tape
for heating a condensate drainage pipe (on site) and a condensate drip tray KWD with thermostat and microfuses
Output: 40-80 W, 230 V
Length: cable 1.5 m
Heating tape 2 m

Part No. 6033 374



Control set (switching contactor)
for installation in the wall-hanging electrical box.

Necessary for the control of an electric heating element.

Part No. 6033 403

System water protection filter FGM050-200
For horizontal installation in return
For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop
Consisting of:
- Filter head and bowl in brass
- Magnetic insert (nickel-neodymium)
- 2 pressure gauges
- Very large filter surface in stainless steel
- Filter fineness 200 µm
- With drain valve
- Connections Rp 2″ internal thread with integrated shut-off valves and union connection (outlet)

Max. flow rate (Δp < 0.1 bar): 7.2 m³/h
Weight: 6.9 kg
Water temperature: max. 90 °C
- incl. steam diffusion-tight insulating shells

Part No. 6058 257

Notice
Fulfills the function of sludge separator and strainer

Strainers
see “Various system components”

Circulating pumps, actuators, buffer storage tanks see separate brochures

Vibration decoupler
for reducing structure-borne noise from heat pumps in the indoor area
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	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Accessories

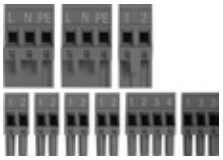
Switching ball valve VBI60...L
DN 25-50, PN 16, 120 °C

- 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	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Motor drive GLB341.9E — 2070 331
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

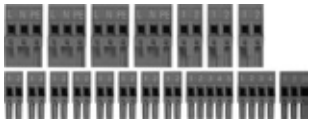
For active cooling, the installation of a flow controller is mandatory!



Expansion connector set — 6032 509
for the automatic heat pump device ECR461
Use for additional function:
- Flow monitor
- Crankcase bottom heating

(included in the scope of delivery for Belaria® twin A, twin AR, dual AR)
- Condensation drain heating
- Heat quantity metering

Plugs:
- 1 230 V digital input
- 2 230 V outputs
- 4 low-voltage inputs
- 1 ratio. Input
- 1 4-pin low-voltage input



Universal plug set — 6032 510
for automatic heat pump device ECR461
Plugs:
- 3 digital 230 V inputs
- 4 230 V outputs
- 6 low-voltage inputs
- 2 low-voltage outputs
- 1 ratio. input
- 1 electronic expansion valve
- 1 4-pin low-voltage input

Service

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® twin A (32)

Type		(32)	
		1st stage	2nd stage
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	173	
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	129	
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	4.4	3.3
Max. performance data heating in acc. with EN 14511			
• Heat output A2W35	kW [3)]	18.6	31.6
• Coefficient of performance A2W35	COP	4.5	4.0
• Heat output A-7W35	kW [3)]	15.8	26.9
• Coefficient of performance A-7W35	COP	3.8	3.4
Sound data			
• Sound power level EN 12102 outdoor unit [4)]	dB(A)	-	72
• Max. sound power level outdoor unit	dB(A)	-	76
• Sound pressure level 5 m [5), 6)]	dB(A)	-	53
• Sound pressure level 10 m [5), 6)]	dB(A)	-	47
Hydraulic data			
• Max. flow temperature	°C	62	
• Max. operating pressure on the heating side	bar	6	
• Flow/return connection heating	R (ext. thread)	1½″	
• Nominal heating water quantity heating ΔT 5 K (A7W35)	m^3/h	6.6	
• Nominal heating water quantity heating ΔT 8 K (A7W35)	m^3/h	4.2	
• Pressure drop with nominal heating water quantity ΔT 5 K (A7W35)	kPa	26	
• Nominal air volume	m^3/h	5500-11000	
Cooling technical data			
• Refrigerant		R410A	
• Compressor/stages		2/2	
• Refrigerant filling quantity	kg	16.0	
• Compressor oil filling quantity	l	1.9	
Electrical data			
• Electrical connection compressor	V/Hz	3~400/50	
• Electrical connection fan	V/Hz	3~400/50	
• Electrical connection control	V/Hz	1~230/50	
• Max. heat pump operating current	A	25.5	
• Max. compressor operating current	A	12.9	25.4
• Compressor power consumption A2W35	kW	4.1	7.9
• Compressor power consumption A20W55	kW	6.0	12.7
• Max. fan operating current	A	1.45	
• Max. starting current heat pump (with jump start)	A	39.5	
• External protection main current	A	32	
• External protection main current	Type	C,D,K	
• External protection control current	A	13	
• External protection control current	Type	B,C,D,K,Z	
Dimensions/weight			
• Dimensions (H x W x D)	mm	1395 x 1934 x 908	
• Weight	kg	590	

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = incl. defrosting loss

[4)] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

[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.

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

Using a fault-current circuit breaker RCCB type B. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

Belaria® twin AR (32)

Type		(32)	
		1st stage	2nd stage
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++ / A++	
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	177	
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	131	
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	4.5	3.3
Max. performance data heating and cooling in acc. with EN 14511			
• Heat output A2W35	kW [3)]	18.6	31.6
• Coefficient of performance A2W35	COP	4.5	4.0
• Heat output A-7W35	kW [3)]	15.8	26.9
• Coefficient of performance A-7W35	COP	3.8	3.4
• Cooling capacity A35W18	kW	22.7	40.4
• Energy efficiency ratio A35W18	EER	4.3	3.4
• Cooling capacity A35W7	kW	16.2	28.8
• Energy efficiency ratio A35W7	EER	3.4	2.7
Sound data			
• Sound power level EN 12102 outdoor unit [4)]	dB(A)	-	72
• Max. sound power level outdoor unit	dB(A)	-	76
• Sound pressure level 5 m [5), 6)]	dB(A)	-	53
• Sound pressure level 10 m [5), 6)]	dB(A)	-	47
Hydraulic data			
• Max. flow temperature	°C	62	
• Max. operating pressure on the heating side	bar	6	
• Flow/return connection heating	R (ext. thread)	1½″	
• Nominal heating water quantity heating ΔT 5 K (A7W35)	m^3/h	6.6	
• Nominal heating water quantity heating ΔT 8 K (A7W35)	m^3/h	4.2	
• Nominal heating water quantity cooling ΔT 4 K (A35W7)	kPa	6.2	
• Nominal heating water quantity cooling ΔT 4 K (A35W18)	m^3/h	8.7	
• Pressure drop with nominal heating water quantity ΔT 5 K (A7W35)	kPa	26	
• Nominal air volume	m^3/h	5500-11000	
Cooling technical data			
• Refrigerant		R410A	
• Compressor/stages		2/2	
• Refrigerant filling quantity	kg	16.0	
• Compressor oil filling quantity	l	1.9	
Electrical data			
• Electrical connection compressor	V/Hz		
• Electrical connection fan	V/Hz		
• Electrical connection control	V/Hz		
• Max. heat pump operating current	A	25.5	
• Max. compressor operating current	A	12.9	25.4
• Compressor power consumption A2W35	kW	4.1	7.9
• Compressor power consumption A20W55	kW	6.0	12.7
• Max. fan operating current	A	1.5	
• Max. starting current heat pump (with jump start)	A	39.5	
• External protection main current	A	32.0	
• External protection main current	Type		
• External protection control current	A		
• External protection control current	Type		
Dimensions/weight			
• Dimensions (H x W x D)	mm	1395 x 1934 x 908	
• Weight	kg	590	

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = incl. defrosting loss

[4)] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

[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.

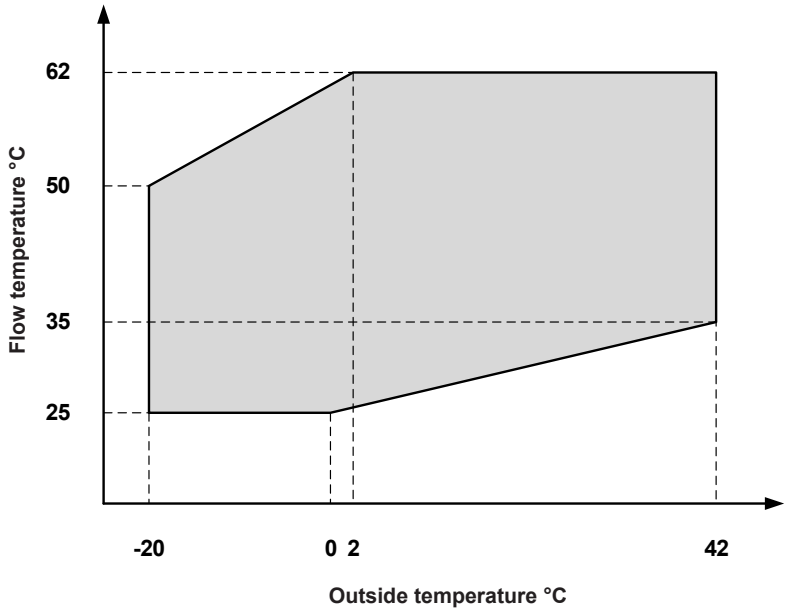
[6)] The sound values apply with a clean evaporator. These values are temporarily exceeded before defrosting.

Using a fault-current circuit breaker RCCB type B. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

A flow controller must be installed for operational reliability in cooling mode.

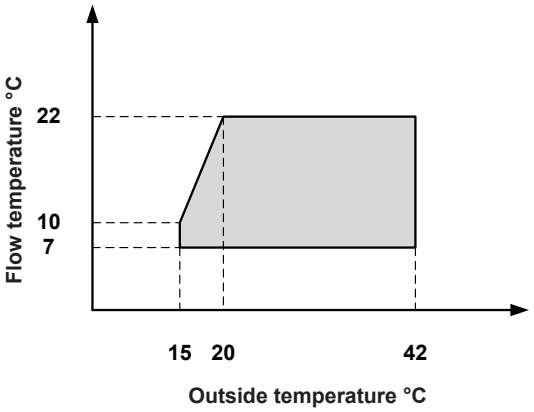
Diagrams of areas of application

Belaria® twin A (32), Belaria® twin AR (32)
Heating and hot water



Area of application of the heat pump for heating

Belaria® twin AR (32)
Cooling



Area of application of the heat pump for cooling

Belaria® twin A, twin AR (32)

Sound pressure level - sound power level
The **sound pressure level** is dependent on the **place of measurement** in a sound field and describes the sound intensity at this place. The sound power level thus is a feature of the sound source and therefore is distance-unrelated; it describes the totality of sound power of the relevant source radiated into all directions.

Structure-borne sound
All connections must be fitted with compensators or vibration absorbers so that no structure-borne sound is being transmitted.

Special precautions must be taken for roof installation.

Sound propagation
The further away you are from a sound source, the lower the acoustic energy, and consequently the immission values.
In general, not only the distance between the heat pump and the immission point should be considered with regard to propagation, but also, depending on the circumstances, the following factors:

- Installation location
  - free-standing (reference factor Q = 2)
  - on the facade (reference factor Q = 4)
  - in the corner (reference factor Q = 8)
- Effect of obstacles
- Reflection against buildings, trees or rocks
- Effect of reflections from the ground
- Attenuation by the air and the ground
- Effect of wind and temperature stratifications of the air

The table below contains reference values and only takes account of the distance and installation location.

Belaria® twin A, Belaria® twin AR type	Sound pressure level outside dB(A)	Distance m	Sound pressure level free installation dB(A)	Sound pressure level on facade dB(A)
(32)	72	1	64	67
		5	50	53

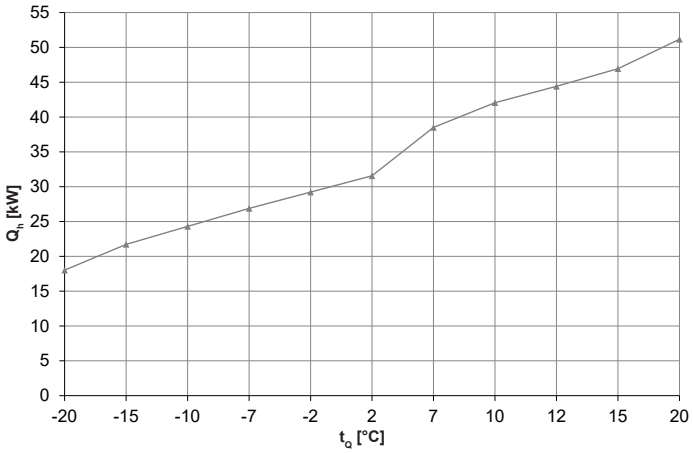
Information on sound levels applies to whisper mode. Values increase by + 4 dB(A) in normal operation

Performance data - heating

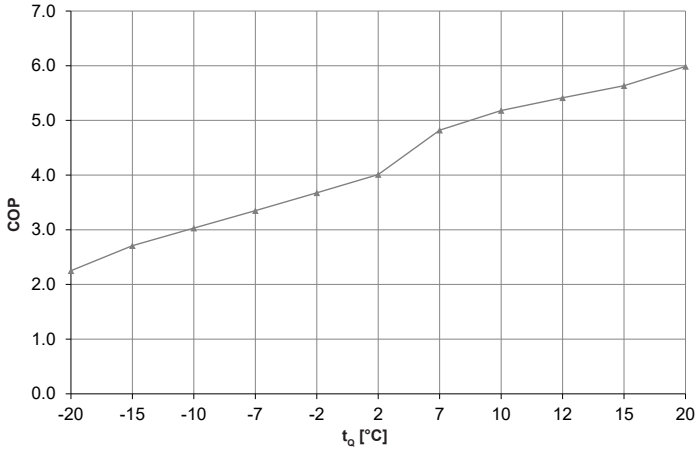
Maximum heat output allowing for defrosting losses

Belaria® twin A (32), twin AR (32)

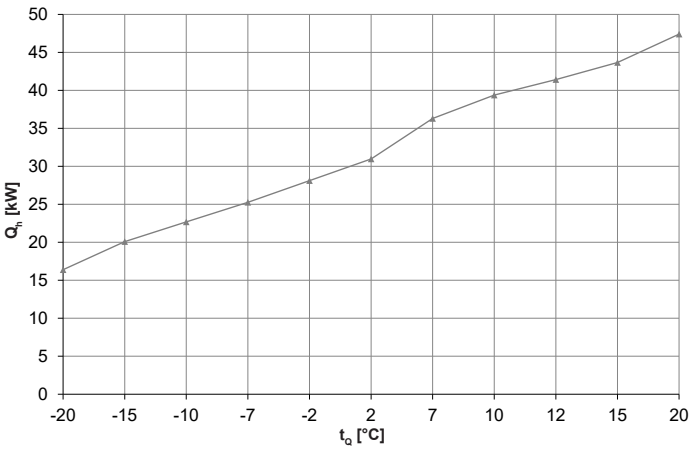
Heat output - t_{VL} 35 °C



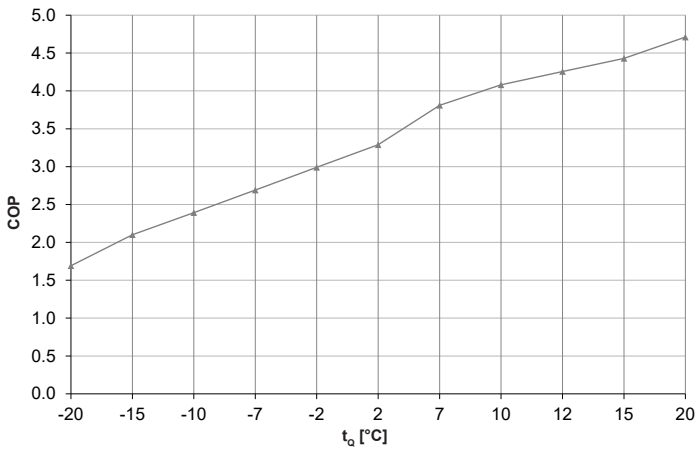
Coefficient of performance - t_{VL} 35 °C



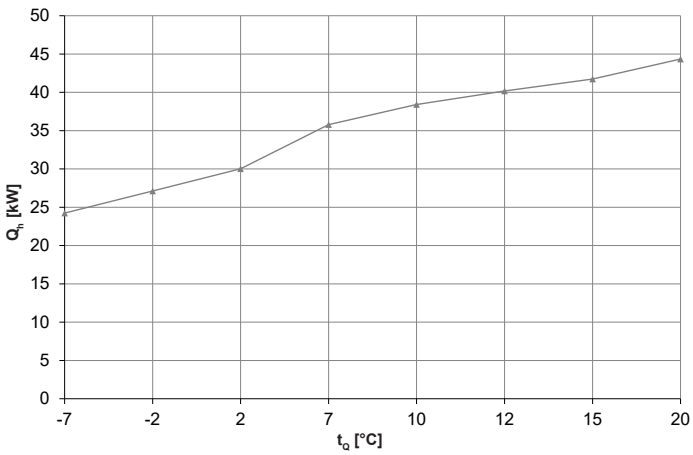
Heat output - t_{VL} 45 °C



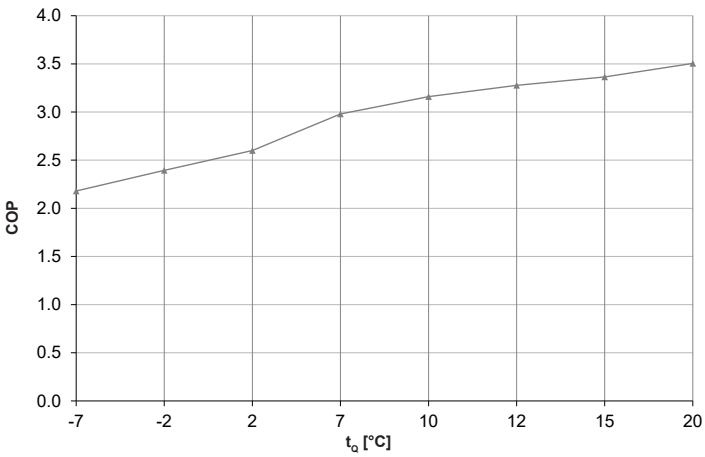
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Coefficient of performance - t_{VL} 55 °C



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

Belaria® twin A/AR (32)

Performance data - heating

Belaria® twin A (32), twin AR (32)

Indications acc. to EN 14511

Type t_{VL} °C	t_Q °C	Q_h kW	(32) P kW	COP
	-20	18.0	8.0	2.3
	-15	21.7	8.0	2.7
	-10	24.3	8.0	3.0
	-7	26.9	8.0	3.4
	-2	29.2	7.9	3.7
35	2	31.6	7.9	4.0
	7	38.5	8.0	4.8
	10	42.0	8.1	5.2
	12	44.4	8.2	5.4
	15	46.9	8.3	5.6
	20	51.2	8.5	6.0
	-20	17.2	8.8	1.9
	-15	20.9	8.8	2.4
	-10	23.5	8.7	2.7
	-7	26.1	8.7	3.0
	-2	28.7	8.7	3.3
40	2	31.3	8.6	3.6
	7	37.4	8.8	4.3
	10	40.7	8.9	4.6
	12	42.9	9.0	4.8
	15	45.3	9.1	5.0
	20	49.2	9.3	5.3
	-20	16.4	9.7	1.7
	-15	20.1	9.6	2.1
	-10	22.7	9.5	2.4
	-7	25.3	9.4	2.7
	-2	28.1	9.4	3.0
45	2	31.0	9.4	3.3
	7	36.3	9.5	3.8
	10	39.4	9.7	4.1
	12	41.4	9.7	4.3
	15	43.7	9.9	4.4
	20	47.4	10.1	4.7
	-20	-	-	-
	-15	-	-	-
	-10	-	-	-
	-7	24.8	10.3	2.4
	-2	27.6	10.4	2.7
50	2	30.5	10.5	2.9
	7	36.0	10.8	3.4
	10	38.9	10.9	3.6
	12	40.8	11.0	3.7
	15	42.7	11.1	3.8
	20	45.9	11.4	4.0
	-20	-	-	-
	-15	-	-	-
	-10	-	-	-
	-7	24.2	11.1	2.2
	-2	27.1	11.3	2.4
55	2	30.0	11.5	2.6
	7	35.8	12.0	3.0
	10	38.4	12.2	3.2
	12	40.2	12.3	3.3
	15	41.7	12.4	3.4
	20	44.3	12.7	3.5
	-20	-	-	-
	-15	-	-	-
	-10	-	-	-
	-7	-	-	-
	-2	-	-	-
60	2	29.4	14.1	2.1
	7	35.4	14.5	2.4
	10	38.0	14.5	2.6
	12	39.7	14.5	2.7
	15	40.7	14.5	2.8
	20	42.4	14.4	2.9

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

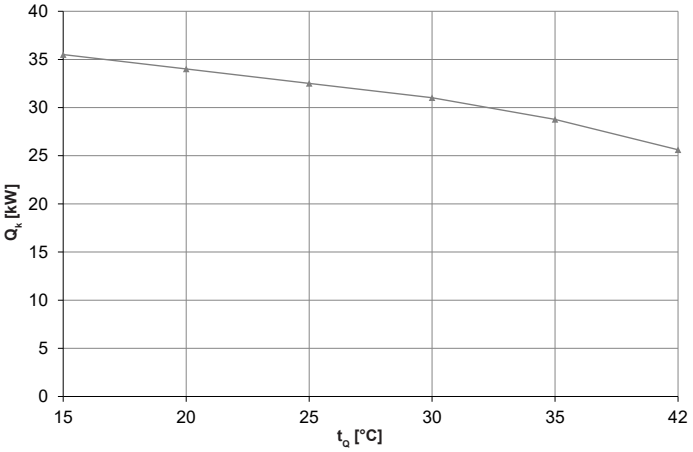
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - cooling

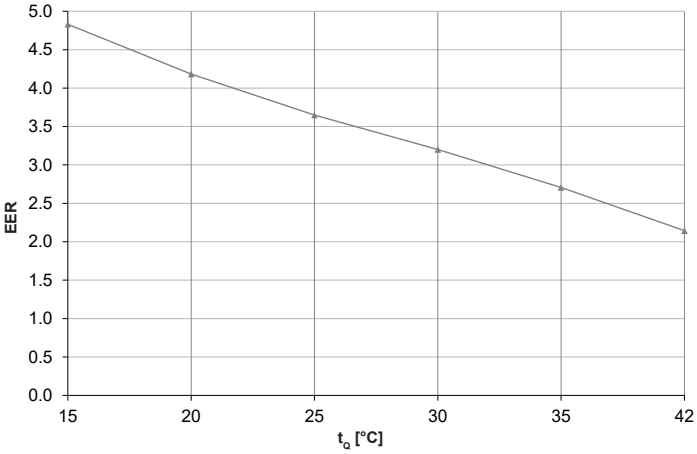
Maximum cooling capacity

Belaria® twin AR (32)

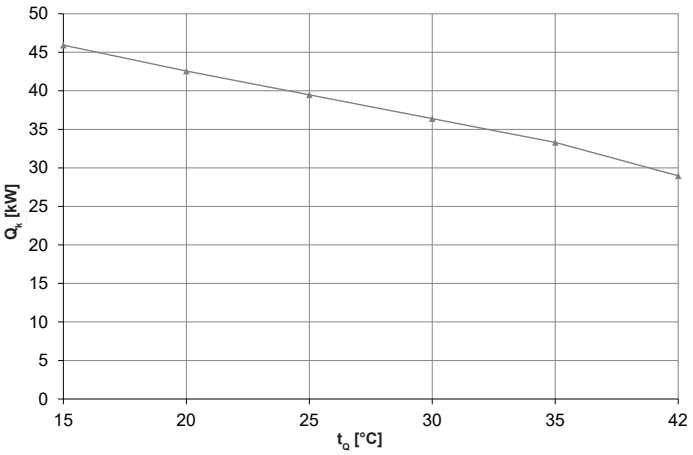
Cooling capacity - t_{VL} 7 °C



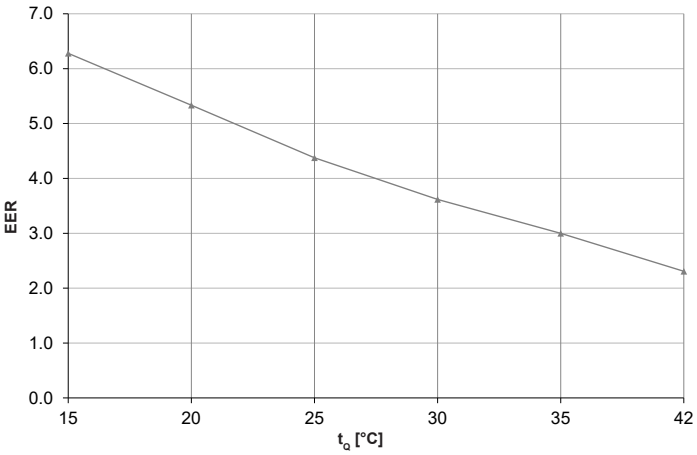
Energy efficiency ratio - t_{VL} 7 °C



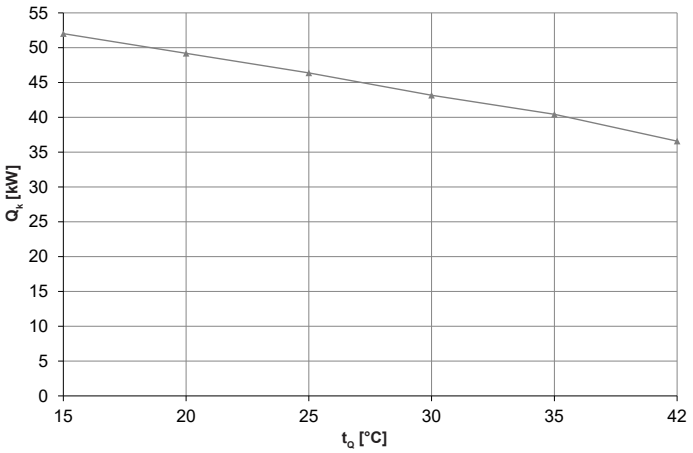
Cooling capacity - t_{VL} 13 °C



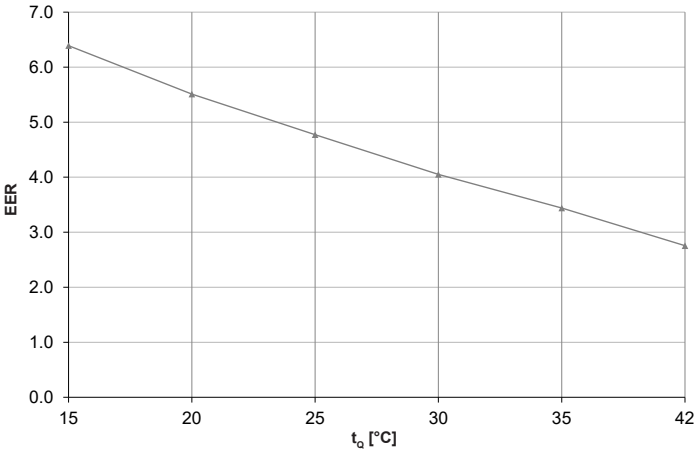
Energy efficiency ratio - t_{VL} 13 °C



Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °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

Belaria® twin A/AR (32)

Performance data - cooling

Belaria® twin AR (32)

Indications acc. to EN 14511

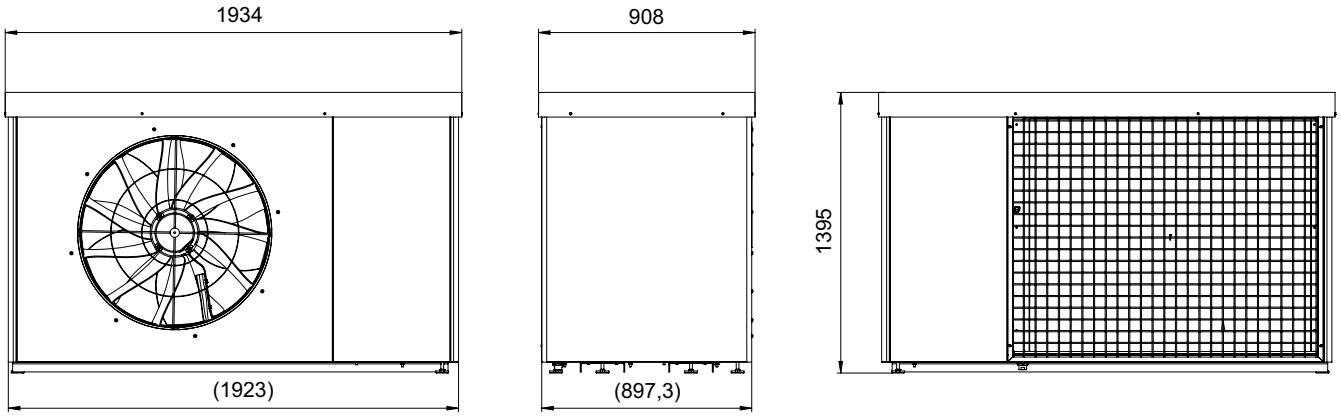
Type t_{VL} °C	t_Q °C	Q_k kW	(32) P kW	EER
7	15	35.5	7.4	4.8
	20	34.0	8.1	4.2
	25	32.5	8.9	3.7
	30	31.0	9.7	3.2
	35	28.8	10.6	2.7
	42	25.6	11.9	2.1
10	15	42.3	6.8	6.2
	20	39.6	7.8	5.1
	25	36.9	8.9	4.2
	30	34.3	9.9	3.5
	35	31.6	10.9	2.9
	42	27.9	12.3	2.3
13	15	44.7	7.2	6.3
	20	42.6	8.0	5.3
	25	39.5	9.0	4.4
	30	36.4	10.1	3.6
	35	33.3	11.1	3.0
	42	29.0	12.6	2.3
15	15	48.4	7.6	6.3
	20	45.2	8.4	5.4
	25	42.2	9.3	4.5
	30	39.1	10.3	3.8
	35	36.2	11.4	3.2
	42	32.9	12.8	2.6
18	15	52.0	8.1	6.4
	20	49.2	8.9	5.5
	25	46.4	9.7	4.8
	30	43.2	10.7	4.1
	35	40.4	11.8	3.4
	42	36.6	13.3	2.8
20	15	54.5	8.2	6.7
	20	51.6	9.1	5.7
	25	48.7	10.0	4.9
	30	45.9	10.9	4.2
	35	42.5	11.9	3.6
	42	39.0	13.1	3.0
22	15	56.9	8.2	6.9
	20	54.0	9.2	5.9
	25	51.1	10.3	5.0
	30	48.2	11.1	4.3
	35	44.5	12.0	3.7
	42	41.4	13.3	3.1

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 of the 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® twin A (32), Belaria® twin AR (32)

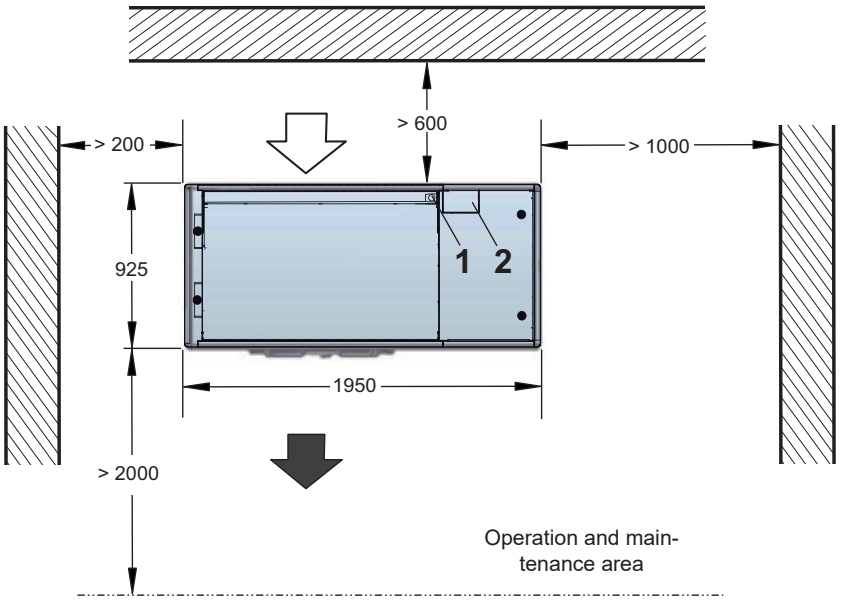
(Dimensions in mm)



Space requirement

(Dimensions in mm)

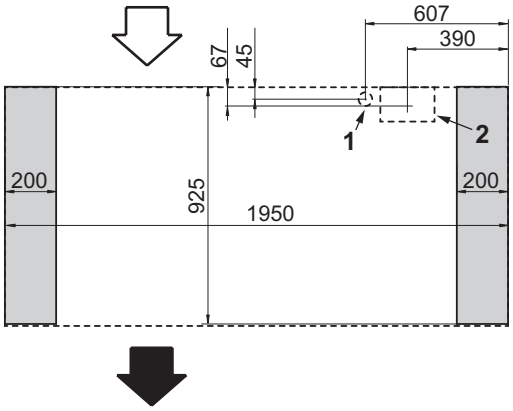
Belaria® twin A (32), Belaria® twin AR (32)



1 Condensate drain (Rp 1″) with electric trace heating
2 Hydraulic and electrical connection

Base plan Belaria® twin A (32), Belaria® twin AR (32)

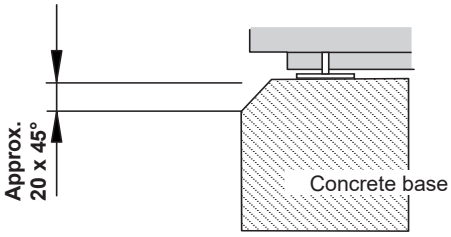
(Dimensions in mm)



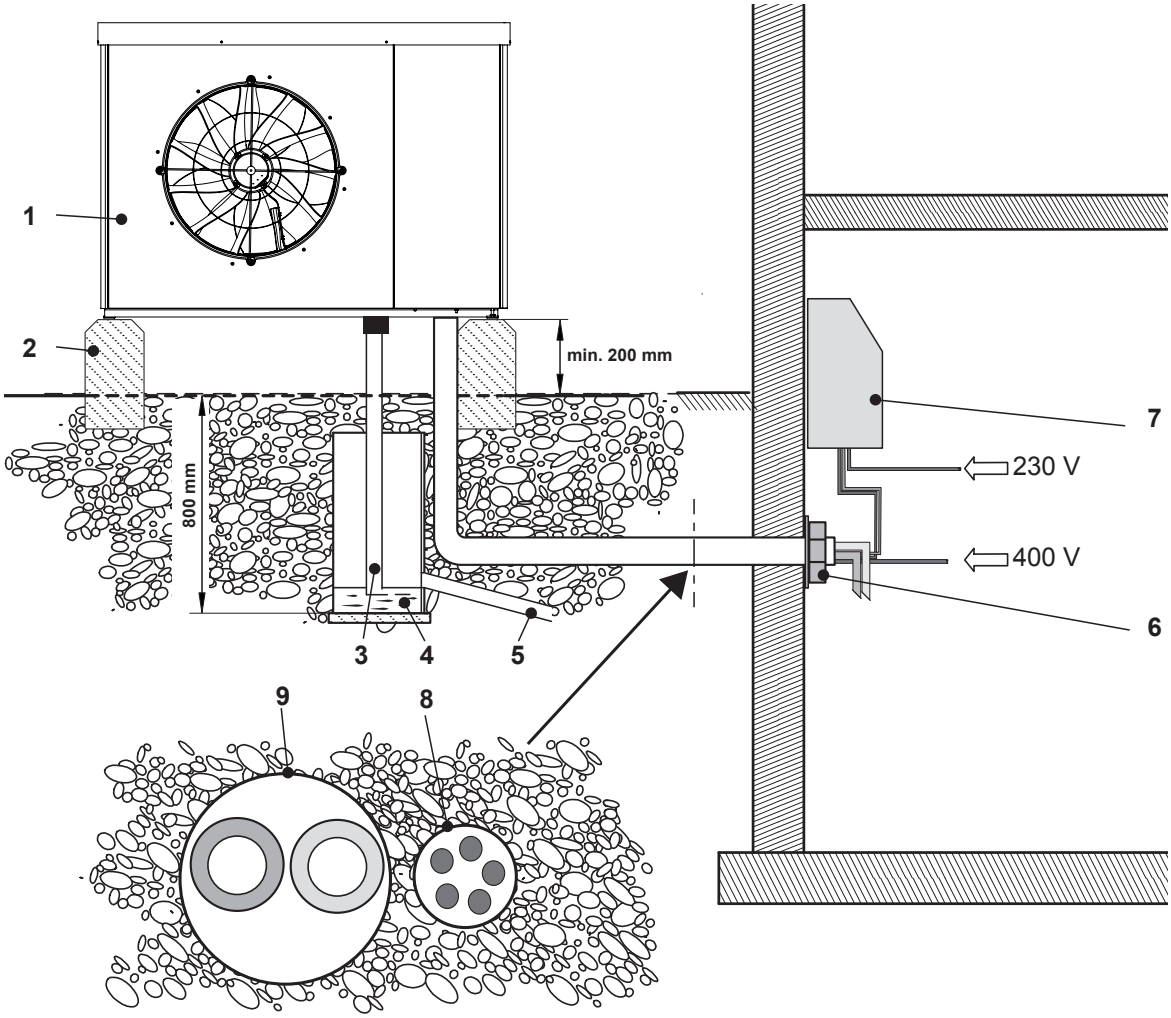
1 Condensate drain (Rp 1″) with electric trace heating
2 Hydraulic and electrical connection

The condensate drain is located on the rear (suction side).

The concrete base must have a level surface the size of the Belaria® twin A/AR (1950 mm × 925 mm).
The base should have chamfered edges.



Configuration and connection diagram Belaria® twin A (32), Belaria® twin AR (32)



1 Belaria® twin A (32)/Belaria® twin AR (32)
2 Concrete base
3 Condensate drain (R 1″) with electr. auxiliary heating (on site)
4 Possible variant with duct diameter/gravel layer
5 Discharge into the sewage system
6 Wall lead-through (hydraulic and electrical connections)
7 Terminal box/TopTronic® E controller
8 Empty tube for electrical connections outdoor unit

Necessary

	Main current	400 V/5-pin/configuration cross section on site
	Control current	230 V/3-pin/configuration cross section on site
	Bus line	24 V/2-pin/2 x 1.0 mm² shielded
	Pump control CP	24 V/2-pin/2 x 1.0 mm² shielded
1 cable 10 x 1.5 mm²	Fault contact CP	230 V/2-pin/2 x 1.5 mm²
	Lock by energy supply company	230 V/2-pin/2 x 1.5 mm²
	Reset	230 V/1-pin/1 x 1.5 mm²
	Heat generator block	230 V/1-pin/1 x 1.5 mm²
	Collective fault	230 V/2-pin/2 x 1.5 mm²
	Electric inset	230 V/1-pin/1 x 1.5 mm²

Options

CP pump ON/OFF (does not apply for pump control 0-10 V)	230 V/2-pin/2 x 1.5 mm²
Fault contact for PLC	230 V/2-pin/2 x 1.5 mm²
Flow rate meter	230 V/4-pin/2 x 1.5 mm²
Electricity meter	230 V/2-pin/2 x 1.5 mm²
USB cable for line recorder	
USB 2.0 extension cable active	

9 Empty tube for hydraulic connections outdoor unit

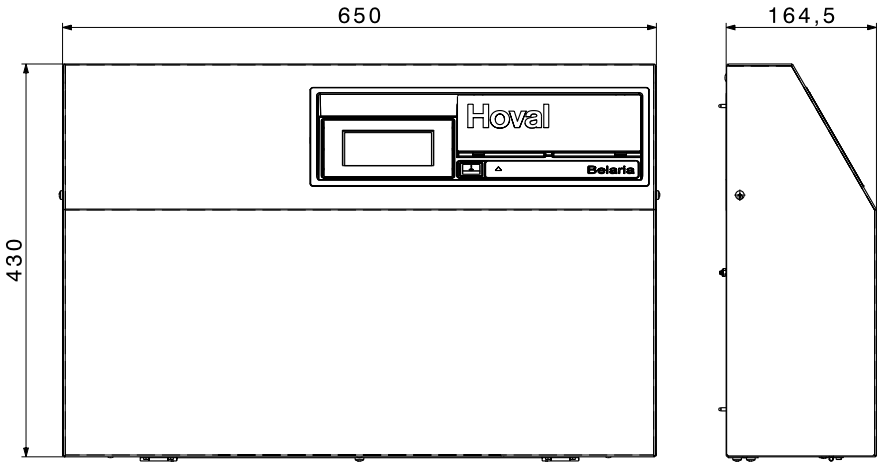
Heating flow	(32) R 1½″
Heating return	(32) R 1½″

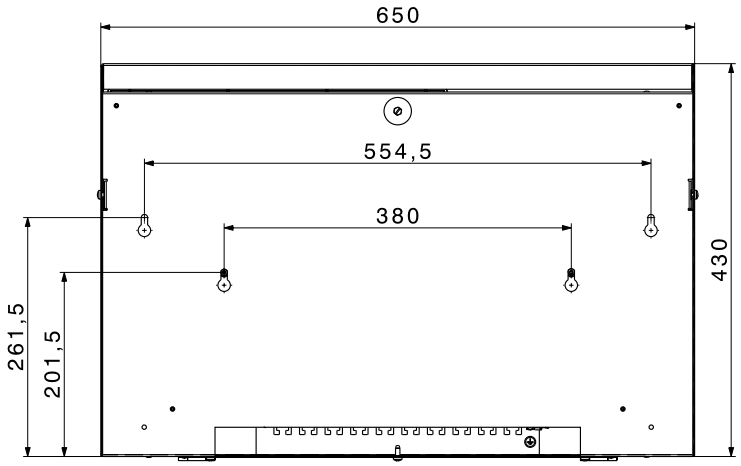
Frost resistance must be taken into account if there are prolonged power outages.

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

Electrical box for Belaria® twin A (32), Belaria® twin AR (32)

(Dimensions in mm)





Hoval Belaria® dual AR

Air/water heat pump

- Air/water heat pump in compact design for outdoor installation
- High energy efficiency
- Evaporator and refrigeration part are placed adjacent to one another. The refrigeration part is encapsulated with electrolytically galvanised, powder-coated and sound-insulated steel sheets. Colour light grey (RAL 7035)
- Covering made of sheet steel Colour anthrazite (DB 703)
- Due to the intermediate refrigerant injection, flow temperatures of 65 °C are possible at -20 °C outdoor temperature
- With large-area, multi-row aluminium/copper ribbed pipe evaporator and copper-brazed plate-type condenser made from stainless steel
- Two electronic expansion valves for the highest efficiency and operational reliability
- Two speed-controlled axial fans made from high-strength composite material with vanes as a compact unit for low energy consumption and the lowest noise level
- Two separate refrigeration circuits in one casing
- Two electronic starting current limiters including phase and phase-sequence monitoring
- With cooling function through inversion of cycle
- Filled with refrigerant R410A, wired up internally ready for connection
- Electrical box for wall mounting inside the building with built-in TopTronic® E controller
- The electrical box is not included in the scope of delivery and must be ordered in addition as an accessory.
- Strainer ball valve installed
- Connecting hoses already fitted. Heating side pipework in the casing

Model range

Belaria® dual AR type			Refrigerant	Max. flow	Heat output A2W35		Cooling capacity A35W18	
	35 °C	55 °C		°C	stage 1 kW	stage 2 kW	stage 1 kW	stage 2 kW
(60)	A++	A+	2 x R410A	65	25.1	50.3	35.1	70.5

Condensate connection

- The discharge pipe must be configured with a sufficient slope and without a change of section.
- The customer is responsible for providing the water connections and condensate discharge pipe outdoors and ensuring that they are protected against frost (see base plan).

Hydraulic connections

- Heating connections with flexible hoses downwards

Electrical connections

- Connection from below (see base plan)

TopTronic® E controller

Control panel

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

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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

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:
  - Heating circuit module expansion or
  - Universal module expansion or
  - Heat balancing module expansion
- 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
- One-piece design. Compact unit wired-up internally ready for connection.

Recommended accessories
- Continuous, speed-controlled high-efficiency pump

Air/water heat pump - 2-stage

Hoval Belaria® dual AR

Belaria® dual AR type	Heat output for A2W35 stage 1 kW	Heat output for A2W35 stage 2 kW	Cooling capacity for A35W18 stage 1 kW	Cooling capacity for A35W18 stage 2 kW	Part No.
(60)	25.1	50.3	35.1	70.5	7016 825

Notice
Corresponding charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0–10 V or PWM1

Stratos premium pump
with IF module Stratos Ext. Off (0-10 V)

See “Circulating pumps”

Energy efficiency class
See Description

Notice
A buffer storage tank must be provided.

Matching buffer storage tanks
see “Calorifiers”

The electrical box with built-in TopTronic® E controller must be ordered separately.

If the heat pump is ordered without electrical box, engineering must absolutely be performed by Hoval, otherwise it will not be taken into operation.

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

Further information
see “Description”

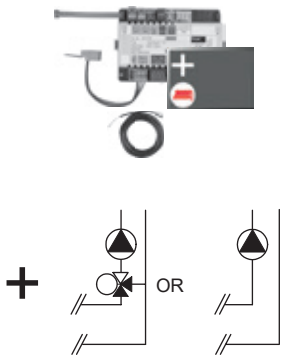
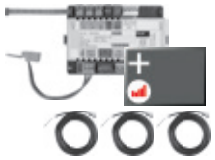
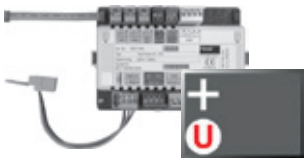
Electric heating elements
see “Calorifiers” - chapter “Electric heating elements”

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
	**Set vibration-damping adjustable feet 55/65** for Belaria® dual AR (60) for reducing the transmission of solid-borne noise Set comprises 4 vibration damping feet, threaded rod and lock nut Material elastomer part: NR, black Material housing: galvanised steel, chromated	6040 854
	**Vibration damper set SDF** for Belaria® dual AR (60) for reducing transmission of solid-borne sound to the substructure and the hydraulic connection lines Consisting of: - 2 vibration dampers compressor-side - 2 vibration dampers evaporator side - 4 sound-insulating fastening feet for vibration dampers - 2 double-bellows rubber compensators DN 50 made of stainless steel - Fastening material	6055 451

TopTronic® E module expansions

for TopTronic® E basic module heat generator

	Part No.
 **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!	6034 576
 **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.	6037 062
 **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	6034 575

Flow rate sensor sets

Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 8	G ¾″	0.9-15	6038 526
DN 10	G ¾″	1.8-32	6038 507
DN 15	G 1″	3.5-50	6038 508
DN 20	G 1¼″	5-85	6038 509
DN 25	G 1½″	9-150	6038 510

Brass housing

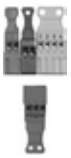
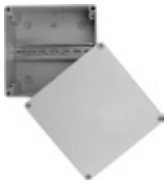
Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950
DN 40	G 2″	22-400	6055 092

Application recommended by Hoval
Flow rate sensor set DN 40 made of brass.
Installation location within the heat pump..

Recommended accessory:
High-efficiency pump with continuously variable speed control

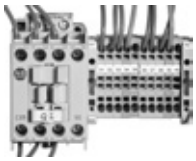
Notice
The flow rate sensor set must be installed without fail. With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented. In order to protect the heat pump from frost in the event of a power failure or for example in bivalence mode, a system separation or other technical measures must be provided on site.

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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

	Part No.
 **Trace heating tape** for heating a condensate drainage pipe (on site) and a condensate drip tray KWD with thermostat and microfuses Output: 40-80 W, 230 V Length: cable 1.5 m Heating tape 2 m	6033 374
 **Control set (switching contactor)** for installation in the wall-hanging electrical box. Necessary for the control of an electric heating element.	6033 403
 **System water protection filter FF050-200** Cast-iron casing with opposite connection flanges at same height for filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure loss. Consisting of: Casing and cover made of cast iron GGG-50 Cover with clip lock - Filter strainer insert made of stainless steel - Cover seal made of NBR - 2 magnetic inserts (nickel-neodymium) - 2 pressure gauges - Very large Filter surface made of stainless steel - Filter fineness 200 µm - With filling and drain valve - Connections flange DN 50 - Nominal pressure: 10 bar Max. flow rate: (Δp < 0.1 bar): 18 m³/h Weight: 15 kg Water temperature max. 80 °C	2076 376

Notice
Fulfills the function of sludge separator and strainer

Further strainers
see “Various system components”

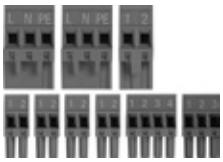
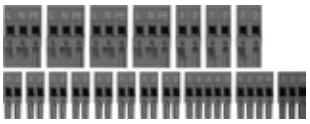
Vibration decoupler
for reducing structure-borne noise from heat pumps in the indoor area
Consisting of:
- 1 vibration decoupler insulated for heating side flat-sealing with union nut
- 2 flat seals
Nominal pressure: PN 10

Dimension	Connection inches	Nominal length mm	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Accessories

		Part No.
	**Switching ball valve VBI60.40-25L** PN 40, DN 40, kvs 25, Internal thread Rp 1½″ 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 Ball valve body: brass Ball: brass chrome-plated Tappet: brass Gland: EPDM O-rings	6052 446
	**Switching ball valve VBI60.50-37L** PN 40, DN 50, kvs 37, Internal thread Rp 2″ 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 Ball valve body: brass Ball: brass chrome-plated Tappet: brass Gland: EPDM O-rings	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

Accessories

	Part No.
 **Expansion connector set** for the automatic heat pump device ECR461 Use for additional function: - Flow monitor - Crankcase bottom heating (included in the scope of delivery for Belaria® twin A, twin AR, dual AR) - Condensation drain heating - Heat quantity metering Plugs: - 1 230 V digital input - 2 230 V outputs - 4 low-voltage inputs - 1 ratio. Input - 1 4-pin low-voltage input	6032 509
 **Universal plug set** for automatic heat pump device ECR461 Plugs: - 3 digital 230 V inputs - 4 230 V outputs - 6 low-voltage inputs - 2 low-voltage outputs - 1 ratio. input - 1 electronic expansion valve - 1 4-pin low-voltage input	6032 510

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® dual AR (60)

Type		(60)
• Energy efficiency class of the compound system with control	35 °C/55 °C	A++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	160
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	125
• Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	4.0/3.2
Max. performance data heating and cooling in acc. with EN 14511		
• Heat output A2W35	kW	50.3
• Coefficient of performance A2W35	COP	3.6
• Heat output A-7W35	kW	45.5
• Coefficient of performance A-7W35	COP	3.1
• Cooling capacity A35W18	kW	70.5
• Energy efficiency ratio A35W18	EER	3.3
• Cooling capacity A35W7	kW	49.2
• Energy efficiency ratio A35W7	EER	2.4
Sound data		
• Max. sound power level 1-stage day operation	dB(A)	70
• Max. sound power level 2-stage day operation	dB(A)	73
• Max. sound power level 1-stage whisper mode	dB(A)	66
• Max. sound power level 2-stage whisper mode	dB(A)	67
• Sound pressure level at 5 m [3)]	dB(A)	48
• Sound pressure level at 10 m [3)]	dB(A)	42
Hydraulic data		
• Maximum flow temperature	°C	65
• Nominal heating water quantity heating ΔT 5 K (A7W35)	m^3/h	11.9
• Nominal heating water quantity heating ΔT 8 K (A7W35)	m^3/h	7.5
• Nominal heating water quantity cooling ΔT 4 K (A35W7)	m^3/h	10.6
• Nominal heating water quantity cooling ΔT 4 K (A35W18)	m^3/h	15.2
• Pressure drop with nominal heating water quantity ΔT 5 K (A7W35)	kPa	39
• Max. operating pressure on the heating side	bar	6
• Flow/return connection heating	R (ext. thread)	2″
• Built-in condensate drain	R (ext. thread)	2″
• Built-in fan		2 x owl-wing axial fan
• Nominal air quantity	m^3/h	2 x 11000
• Max./min. fan speed	rpm	700/175
Cooling technical data		
• Refrigerant		R410A
• Refrigeration circuits		2
• Compressor stages		2
• Refrigerant filling quantity	kg	2 x 17.8
• Compressor oil filling quantity	l	2 x 3.3
Electrical data		
• Compressor/heating element/fan connections	V/Hz	3~400/50
• Control electrical connection	V/Hz	1~230/50
• Starting current (compressor and fan)	A	80.5
• Compressor operating current	A	2 x 21.61
• Fan operating current (maximum value)	A	2 x 1.45
• Fan power consumption (total)	W	2 x 620
• Main current fuse	A	63 A
• Control current fuse	A	B 13
• Heating element fuse (up to 9 kW)	A	B 13
Dimensions/Weight		
• Dimensions (H x W x D)	mm	1500 x 3272 x 895
• Weight	kg	880

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

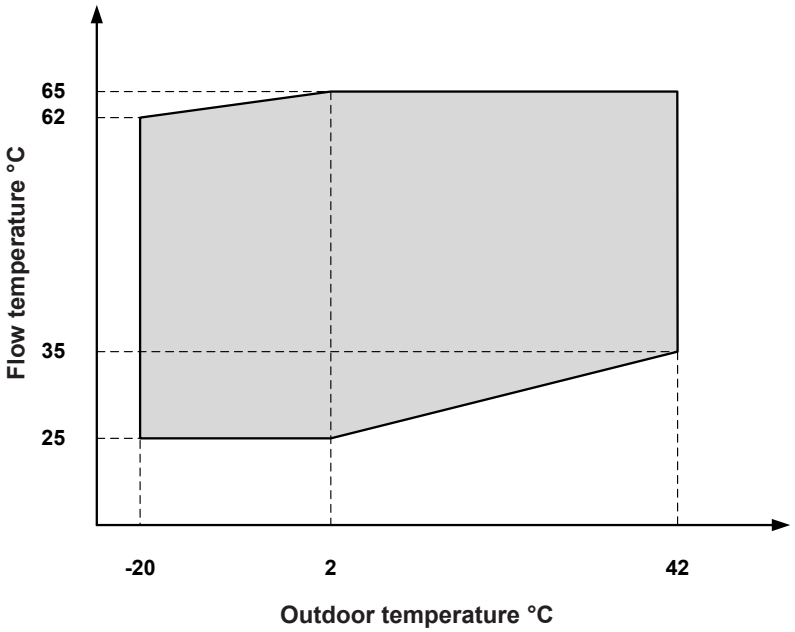
[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] 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. IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

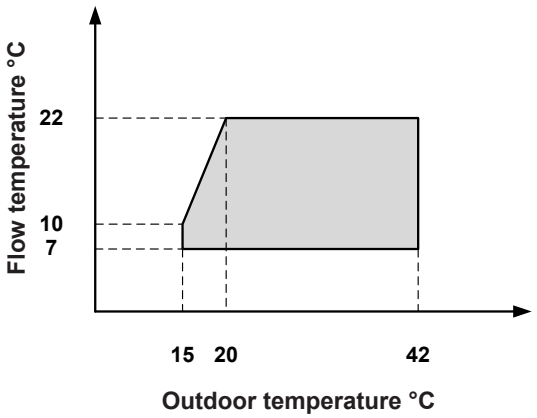
Diagrams of areas of application

Heating and hot water



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

Cooling



Area of application of the heat pump for cooling

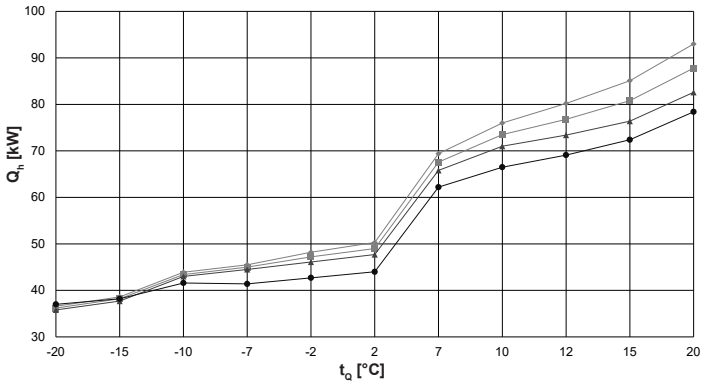
Performance data – heating

Maximum heat output allowing for defrosting losses

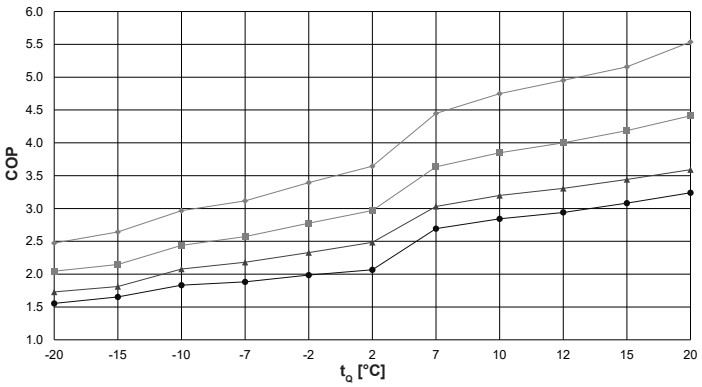
Belaria® dual AR (60)

Full load (2-stage)

Heat output

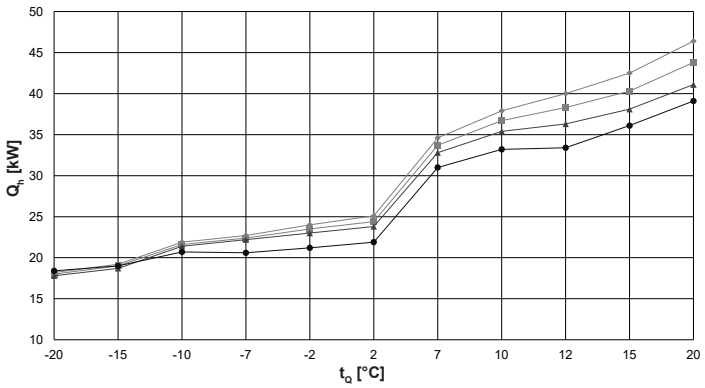


Coefficient of performance

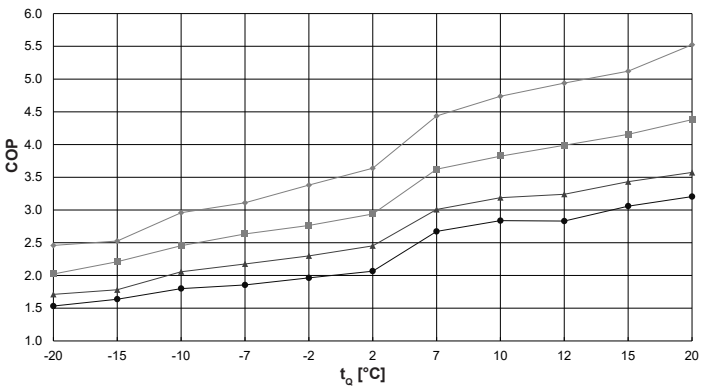


Partial load (1-stage)

Heat output



Coefficient of performance



t_Q = source temperature (°C)
Q_h = heat output at full load (kW), measured in accordance with standard EN 14511
COP = Coefficient of Performance in accordance with standard EN 14511

35 °C
45 °C
55 °C
62 °C

Performance data – heating

Belaria® dual AR

Data according to EN 14511

Type		(60) Stage 1			(60) Stage 2		
t_{VL} °C	t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
	-20	18.2	7.4	2.5	36.6	14.8	2.5
	-15	19.2	7.6	2.6	38.6	14.6	2.6
	-10	21.9	7.4	2.9	43.9	14.8	3.0
	-7	22.7	7.3	3.1	45.5	14.6	3.1
	-2	24.0	7.1	3.4	48.2	14.2	3.4
35	2	25.1	6.9	3.6	50.3	13.8	3.6
	7	34.6	7.8	4.4	69.4	15.6	4.5
	10	37.9	8.0	4.7	76.0	16.0	4.7
	12	40.0	8.1	4.9	80.2	16.2	4.9
	15	42.5	8.3	5.1	85.1	16.5	5.2
	20	46.4	8.4	5.5	93.0	16.8	5.5
	-20	18.0	8.9	2.0	36.2	17.7	2.0
	-15	19.0	8.6	2.2	38.2	17.8	2.1
	-10	21.6	8.8	2.5	43.4	17.8	2.4
	-7	22.4	8.8	2.6	45.0	17.5	2.6
	-2	23.5	8.5	2.8	47.2	17.0	2.8
45	2	24.4	8.3	2.9	49.0	16.5	3.0
	7	33.7	9.3	3.6	67.6	18.6	3.6
	10	36.7	9.6	3.8	73.5	19.1	3.6
	12	38.3	9.6	4.0	76.8	19.2	4.0
	15	40.3	9.7	4.2	80.8	19.3	4.2
	20	43.8	10.0	4.4	87.8	19.9	4.4
	-20	17.8	10.4	1.7	35.8	20.7	1.7
	-15	18.7	10.5	1.8	37.7	20.8	1.8
	-10	21.4	10.4	2.1	43.0	20.7	2.1
	-7	22.2	10.2	2.2	44.5	20.4	2.2
	-2	23.0	10.0	2.3	46.1	19.8	2.3
55	2	23.8	9.7	2.5	47.7	19.2	2.5
	7	32.8	10.9	3.0	65.8	21.7	3.0
	10	35.4	11.1	3.2	71.0	22.2	3.2
	12	36.6	11.2	3.3	73.4	22.2	3.3
	15	38.1	11.1	3.4	76.4	22.2	3.4
	20	41.1	11.5	3.6	82.6	23.0	3.6
	-20	18.4	12.0	1.5	37.0	23.8	1.6
	-15	19.0	11.6	1.6	38.2	23.1	1.7
	-10	20.7	11.5	1.8	41.6	22.7	1.8
	-7	20.6	11.1	1.9	41.4	22.0	1.9
	-2	21.2	10.8	2.0	42.7	21.5	2.0
62	2	21.9	10.6	2.1	44.0	21.3	2.1
	7	31.0	11.6	2.7	62.2	23.1	2.7
	10	33.2	11.7	2.8	66.5	23.4	2.6
	12	33.4	11.8	2.9	69.1	23.5	2.9
	15	36.1	11.8	3.1	72.4	23.5	3.1
	20	39.1	12.2	3.2	78.4	24.2	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 in accordance with standard EN 14511

Observe daily power interruptions!
see “Engineering heat pumps general”

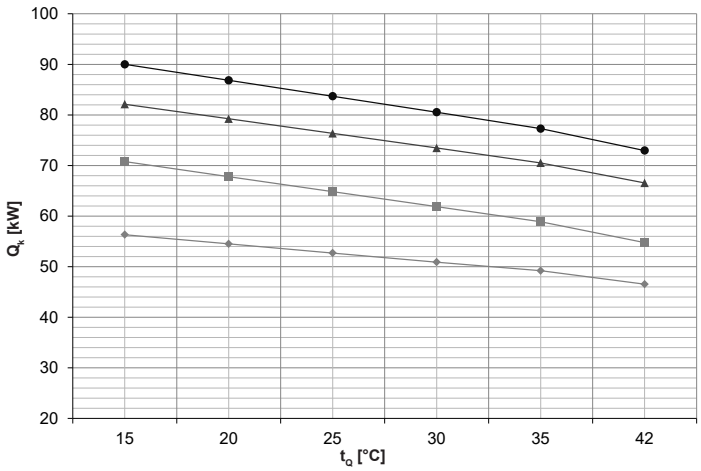
Performance data – cooling

Maximum cooling capacity

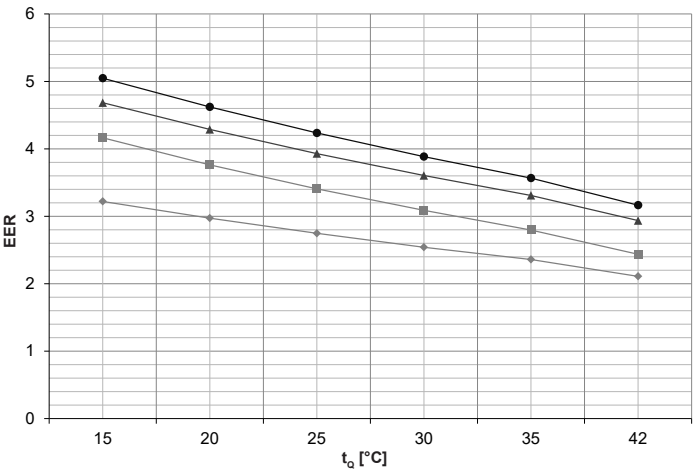
Belaria® dual AR (60)

Full load

Cooling capacity

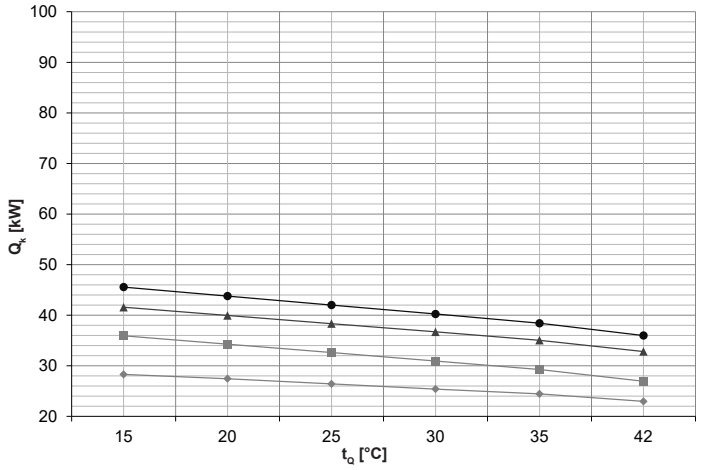


Energy efficiency ratio

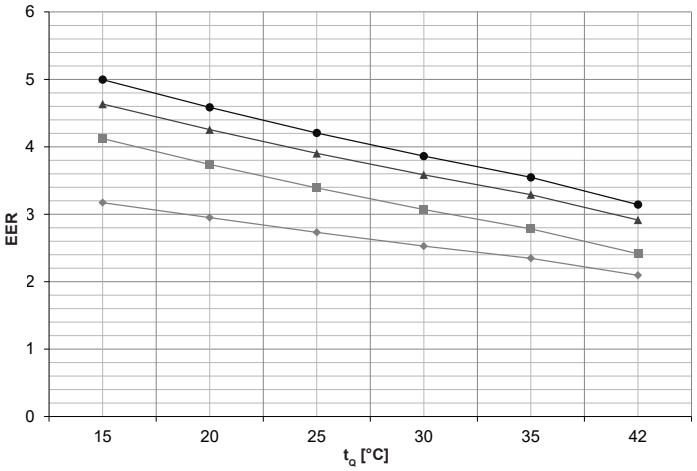


Partial load

Cooling capacity



Energy efficiency ratio



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

7 °C
12 °C
18 °C
22 °C

Performance data – cooling

Belaria® dual AR (60)

Data according to EN 14511

Type		(60) Stage 1			(60) Stage 2		
t_{VL} °C	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER
7	15	28.3	8.9	3.2	56.3	17.5	3.2
	20	27.4	9.3	3.0	54.5	18.3	3.0
	25	26.4	9.7	2.7	52.7	19.2	2.7
	30	25.4	10.1	2.5	50.9	20.0	2.5
	35	24.5	10.4	2.3	49.2	20.9	2.4
	42	23.0	11.0	2.1	46.5	22.1	2.1
10	15	33.0	8.8	3.7	65.0	17.2	3.8
	20	31.5	9.2	3.4	62.5	18.1	3.4
	25	30.1	9.6	3.1	60.0	19.1	3.1
	30	28.7	10.1	2.9	57.5	20.0	2.9
	35	27.3	10.5	2.6	55.0	21.0	2.6
	42	25.4	11.1	2.3	51.5	22.3	2.3
13	15	35.9	8.7	4.1	70.8	17.0	4.2
	20	34.3	9.2	3.7	67.8	18.0	3.8
	25	32.6	9.6	3.4	64.8	19.0	3.4
	30	30.9	10.1	3.1	61.9	20.0	3.1
	35	29.3	10.5	2.8	58.9	21.1	2.8
	42	26.9	11.2	2.4	54.8	22.5	2.4
15	15	38.8	8.9	4.4	76.5	17.3	4.4
	20	37.1	9.3	4.0	73.5	18.3	4.0
	25	35.5	9.7	3.6	70.6	19.2	3.7
	30	33.8	10.2	3.3	67.7	20.2	3.3
	35	32.2	10.6	3.0	64.7	21.2	3.1
	42	29.9	11.2	2.7	60.7	22.6	2.7
18	15	41.6	9.0	4.6	82.1	17.5	4.7
	20	40.0	9.4	4.3	79.2	18.5	4.3
	25	38.3	9.8	3.9	76.4	19.4	3.9
	30	36.7	10.2	3.6	73.5	20.4	3.6
	35	35.1	10.7	3.3	70.5	21.3	3.3
	42	32.8	11.3	2.9	66.6	22.7	2.9
20	15	43.6	9.1	4.8	86.1	17.7	4.9
	20	41.9	9.5	4.4	83.1	18.6	4.5
	25	40.2	9.9	4.1	80.0	19.6	4.1
	30	38.5	10.3	3.7	77.0	20.6	3.7
	35	36.7	10.7	3.4	73.9	21.5	3.4
	42	34.4	11.4	3.0	69.8	22.9	3.1
22	15	45.6	9.1	5.0	90.0	17.8	5.0
	20	43.8	9.6	4.6	86.9	18.8	4.6
	25	42.0	10.0	4.2	83.7	19.8	4.2
	30	40.2	10.4	3.9	80.5	20.7	3.9
	35	38.4	10.8	3.5	77.3	21.7	3.6
	42	36.0	11.5	3.1	73.0	23.1	3.2

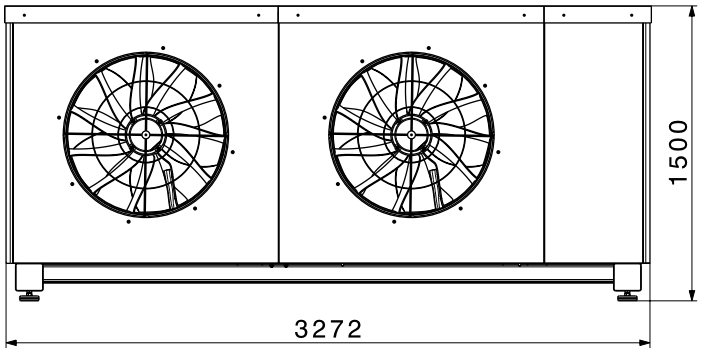
t_{VL} = cooling water flow temperature (°C)
t_Q = source temperature (°C)
Q_k = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption for the overall unit (kW)
EER = Energy Efficiency Ratio for the overall unit in accordance with standard EN 14511

Observe daily power interruptions!
see “Engineering heat pumps general”

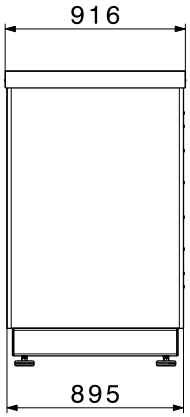
Belaria® dual AR (60)

(Dimensions in mm)

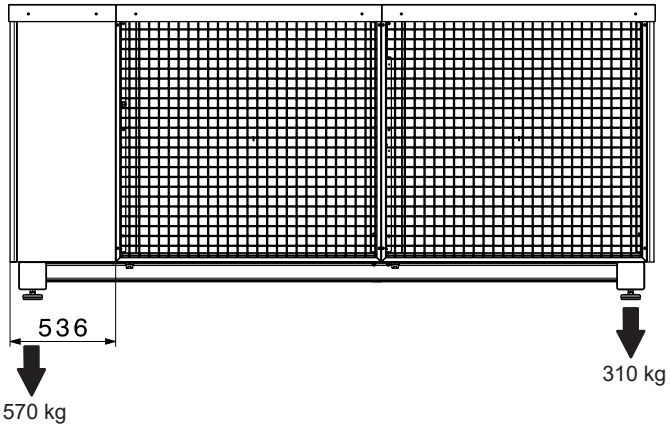
Front view (exhaust side)



Side view

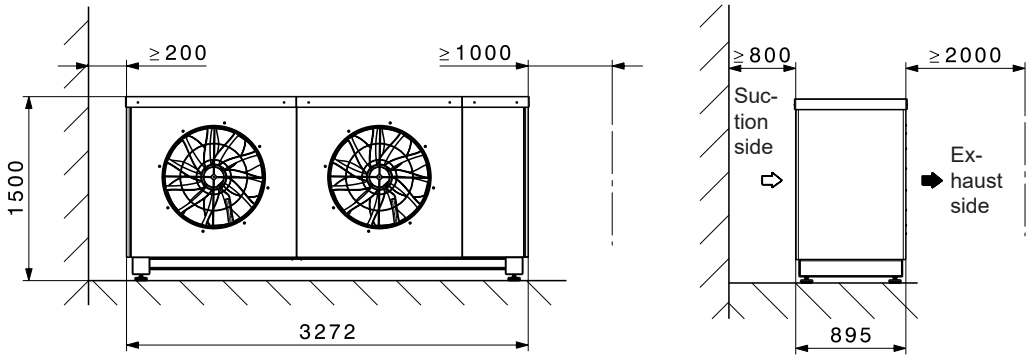


Rear (suction side)



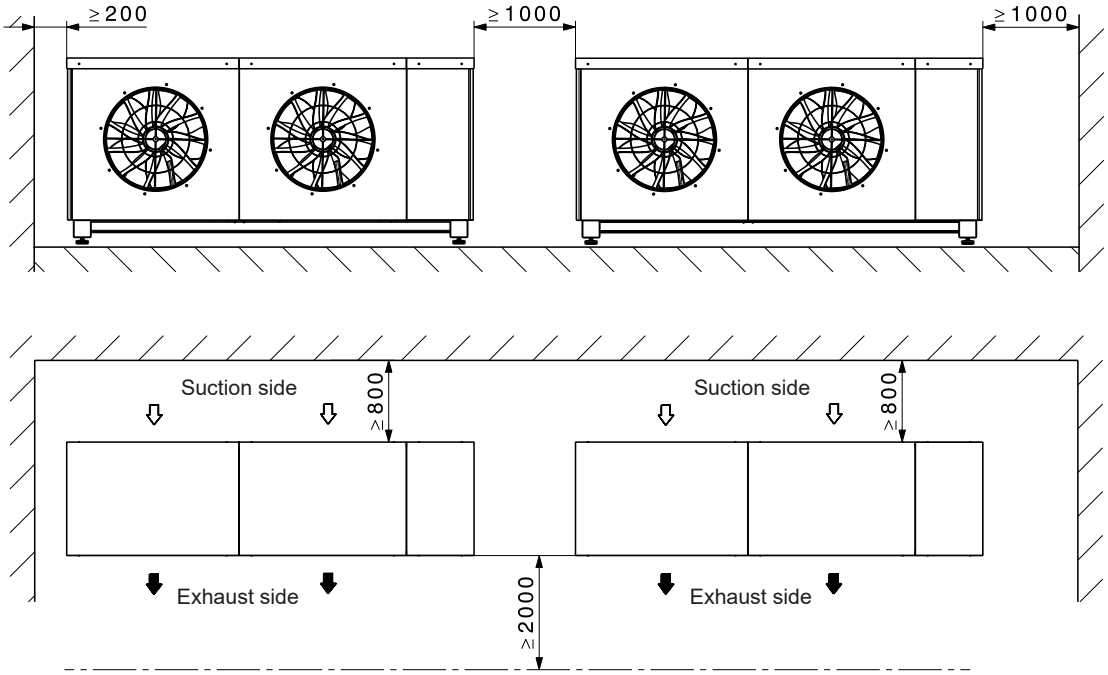
Space requirement

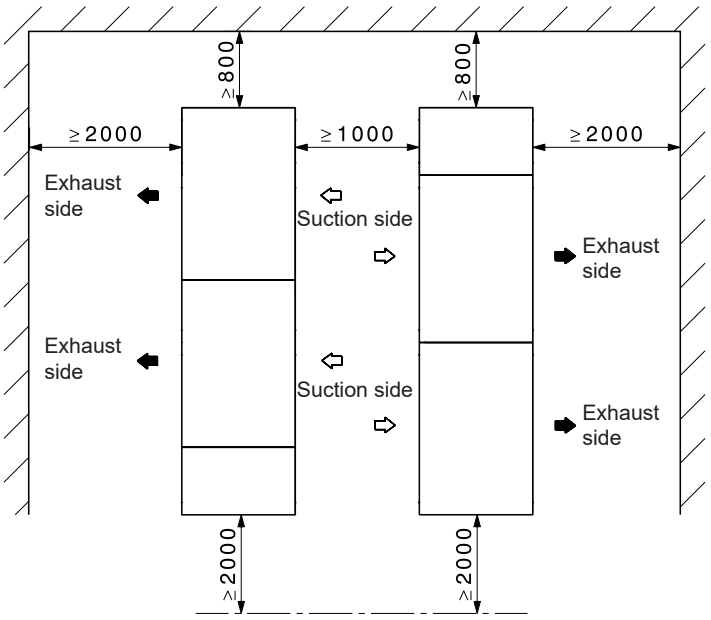
(Dimensions in mm)



Minimum distances for cascade systems

(Dimensions in mm)

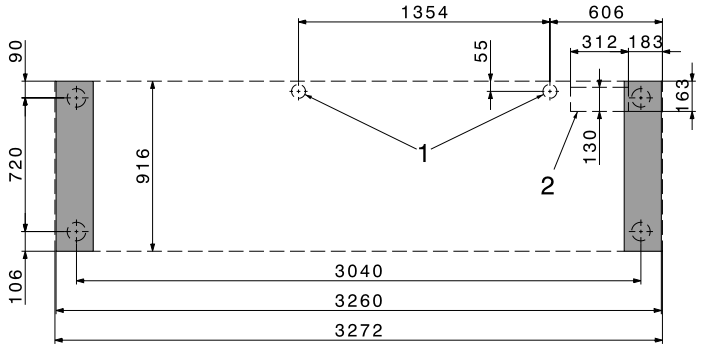




Base design

(Dimensions in mm)

Base plan feet

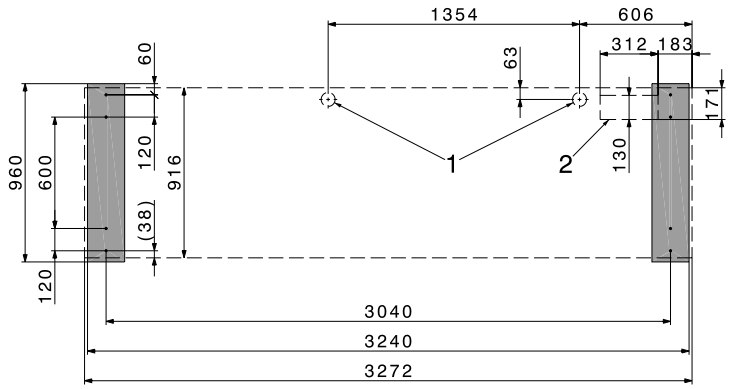


1 Condensate drain with electric auxiliary heating

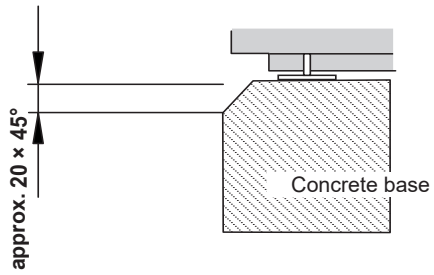
2 Hydraulic and electrical connection

The condensate drain is located on the rear (suction side).

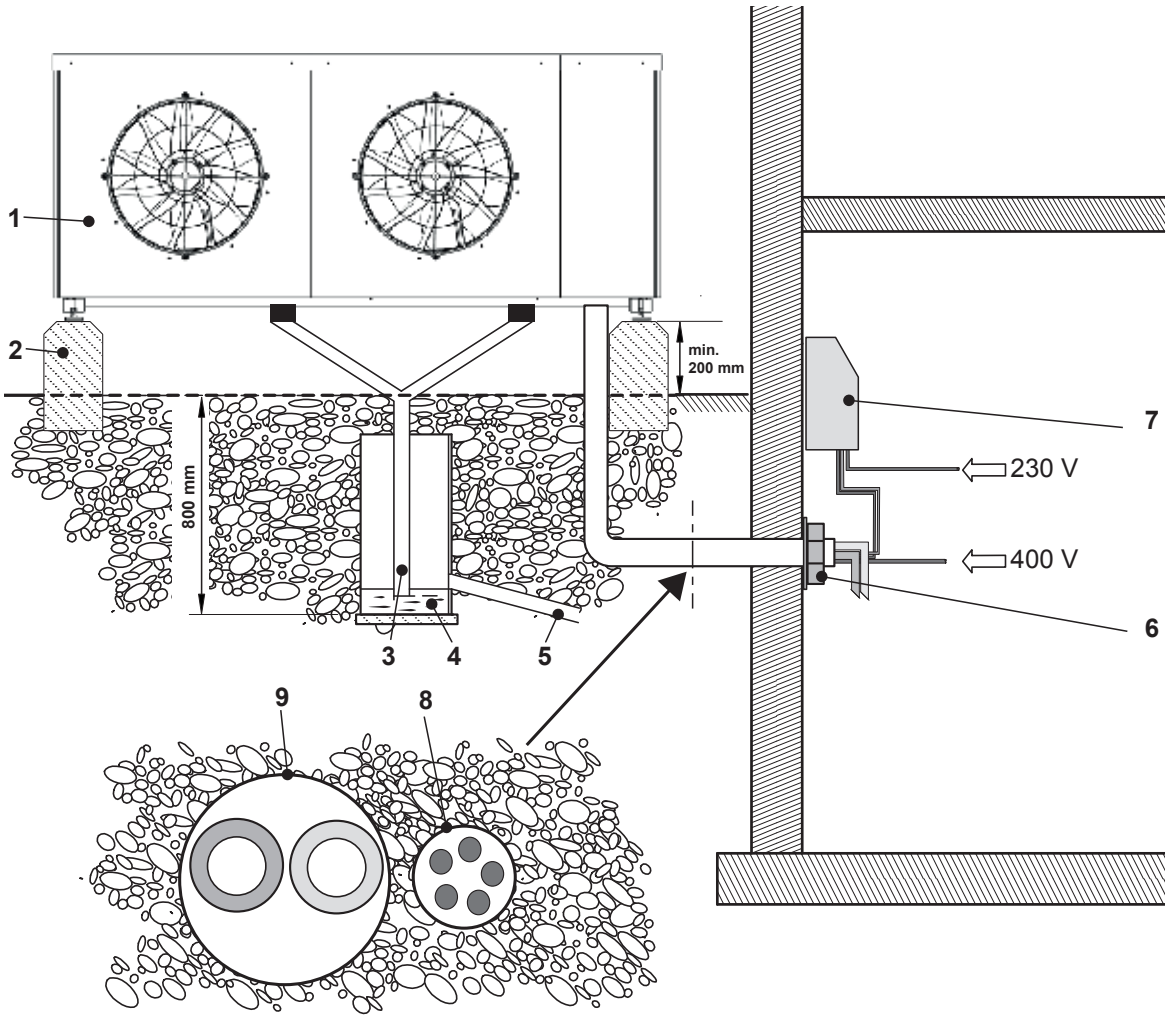
Base plan set of vibration-damping feet



The concrete base must have a level surface the size of the Belaria® dual AR (60).
The base should have chamfered edges.



Configuration and connection diagram for the Belaria® dual AR (60)



1 Belaria® dual AR (60)
2 Concrete base
3 Condensate drain with elec. auxiliary heating (provided by customer)
4 Possible variant with duct (Ø 300 mm)
5 Discharge into the sewage system
6 Wall lead-through (hydraulic and electrical connections)
7 Electrical box/TopTronic® E controller
8 Empty tube for electrical connections for outdoor unit

Necessary

	Main current	400 V/5-pin/configuration cross section on site
	Control current	230 V/3-pin/configuration cross section on site
	Bus line	24 V/2-pin (see wiring diagram)
	Pump control CP	24 V/2-pin (see wiring diagram)
1 cable 10 x 1,5 mm²	Fault contact CP	230 V/2-pin (see wiring diagram)
	Lock by energy supply company	230 V/2-pin (see wiring diagram)
	Reset	230 V/1-pin (see wiring diagram)
	Heat generator block	230 V/1-pin (see wiring diagram)
	Collective fault	230 V/2-pin (see wiring diagram)
	Electric inset	230 V/1-pin (see wiring diagram)
	Flow rate meter	230 V/4-pin (see wiring diagram)

Options

CP pump ON/OFF (does not apply for pump control 0-10 V)	230 V/2-pin (see wiring diagram)
Fault contact for PLC	230 V/2-pin (see wiring diagram)
Electricity meter	230 V/2-pin (see wiring diagram)
USB cable for line recorder	
USB 2.0 extension cable active	

9 Empty tube for hydraulic connections for outdoor unit

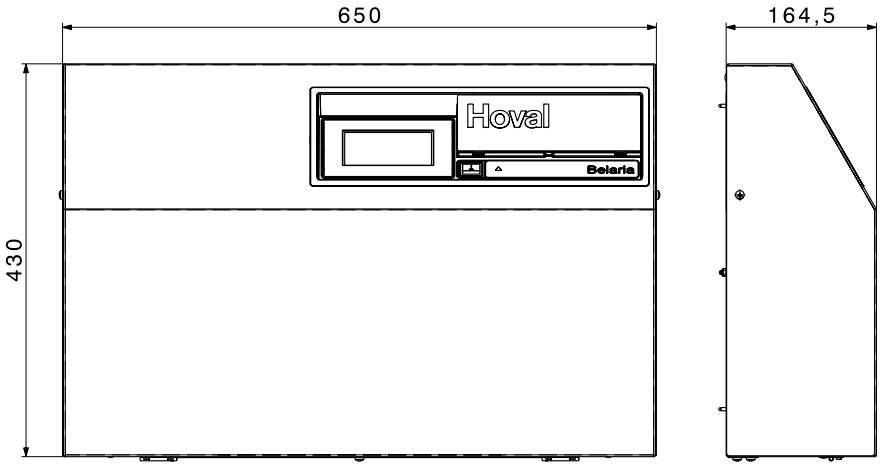
Heating flow	R 2″ *
Heating return	R 2″ *

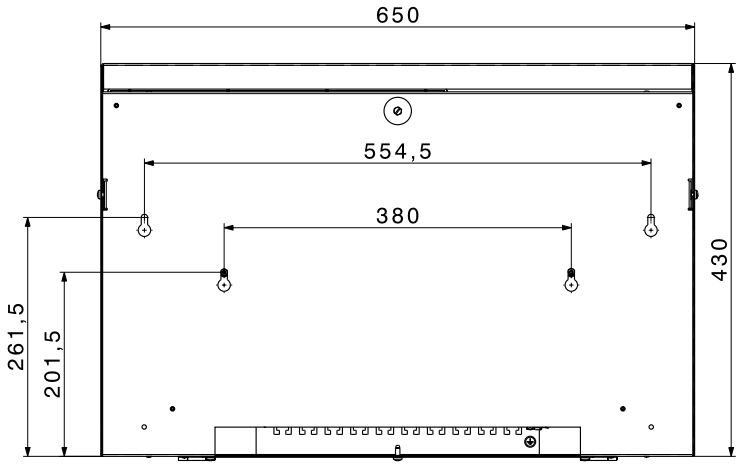
The piping from the boiler room to the heat pump must be configured by the installer. Connecting pipes are not included.

* In cooling mode or with longer pipelines, 2″ pipes are too small.

Electrical box Belaria® dual AR (60)

(Dimensions in mm)





Hoval UltraSource® T comfort
Hoval UltraSource® T compact

Modulating heat pump system for heating and cooling in the living area.
UltraSource® T compact C (8/200) and (13/200) additionally with integrated calorifier (200 litres) in the indoor unit.

UltraSource® T comfort

- Compact floor-mounted brine/water and water/water heat pumps with enclosed scroll compressor controlled by inverter
- UltraSource® T comfort (8) with modulating rotary compressor
  UltraSource® T comfort (13,17) with modulating scroll enclosed compressor
- Casing made from painted, galvanised sheet steel. Colour flame red/brown red (RAL 3000/RAL 3011)
- Acoustically insulated casing with triple mounting of the compressor
- Evaporator and plate-type condenser made of stainless steel/copper
- Integrated components:
  - One speed-regulated high-efficiency pump each on the heating and brine sides
  - Flow sensor/flow meter or heat meter
  - 3-way switching ball valve for heating/domestic hot water (see accessories for domestic hot water set)
  - Brine side diaphragm pressure expansion tank 18 litres mounted
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- TopTronic® E controller installed
- With corresponding separating plate heat exchanger in the primary circuit can also be used as water/water heat pump
- Hydraulic connections
  - Heating connections R 1″ on left or right side. See accessories for connecting hoses
- Brine connection R 1″ on left or right side See accessories for connecting hoses
- Electrical connections at rear

UltraSource® T compact

- Compact floor-mounted brine/water and water/water heat pumps with enclosed scroll compressor controlled by inverter
- UltraSource® T compact (8/200) with modulating rotary compressor
  UltraSource® T compact (13/200) with modulating scroll enclosed compressor
- Casing made from painted, galvanised sheet steel. Colour flame red/brown red (RAL 3000/RAL 3011)
- Acoustically insulated casing with triple mounting of the compressor
- Evaporator and plate-type condenser made of stainless steel/copper
- Integrated calorifier 200 litres
  (can be divided for easier transport into the building; weight 1294 x 770 x 602 mm)
- Enamel painted calorifier with PU hard-foam insulation energy efficiency class A, load profile XL. Maintenance flange and magnesium protection anode built in

Model range

UltraSource® T comfort type	Water/water 35 °C	Water/water 55 °C	Brine/water 35 °C	Brine/water 55 °C	Heat output [1] B0W35 kW	Heat output [1] W10W35 kW
(8)	A+++	A+++	A+++	A+++	1.8-7.9	2.6-10.0
(13)	A+++	A+++	A+++	A+++	2.9-13.3	3.7-13.2
(17)	A+++	A+++	A+++	A+++	4.3-17.6	6.0-21.9

UltraSource® T compact type	Water/water 35 °C	Water/water 55 °C	Brine/water 35 °C	Brine/water 55 °C		Heat output [1] B0W35 kW	Heat output [1] W10W35 kW
(8/200)	A+++	A+++	A+++	A+++	A	1.8-7.9	2.6-10.0
(13/200)	A+++	A+++	A+++	A+++	A	2.9-13.3	3.7-13.2

Energy efficiency class of the compound system with control
[1] Modulation range

- Integrated components:
  - One speed-regulated high-efficiency pump each on the heating and brine sides
  - Flow sensor/flow meter or heat meter
  - Electric heating element 1 to 6 kW
  - Brine side diaphragm pressure expansion tank 18 litres mounted
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- TopTronic® E controller installed
- With corresponding separating plate heat exchanger in the primary circuit can also be used as water/water heat pump
- Internally decoupled against solid-borne noise and can be connected directly
- Hydraulic connections
  - Heating connections R 1″ top
  - Hot and cold water connections Rp ¾″ top
- Brine connection R 1″ on right or left side
- Electrical connections at top

Brine/water application

- Integrated brine pressure monitoring
- Brine safety set consisting of safety valve, automatic air vent and pressure gauge see accessories
- Brine connection on right or left side (comfort version: connection hoses see accessories)
- Hydraulic connection brine/water version see engineering

Water/water application

- For water/water applications, an intermediate circuit is required see engineering
- Safety heat exchanger set consisting of heat exchanger, safety group and diaphragm pressure expansion tank see accessories
- Ground water pump kit see accessories
- Flow monitor see accessories
- Hydraulic connection water/water version see engineering

Cooling

- UltraSource® T comfort and compact can be equipped with a passive cooling set (see accessories)
- Hydraulic version of the cooling functions see engineering

TopTronic® E controller

Control panel
- 4.3-inch colour touchscreen
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

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
  - Universal module expansion or
  - Heat balancing module expansion
- 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” section

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
- One-piece design. Compact unit wired-up internally ready for connection, supplied fully packaged
- Sensor set supplied loose

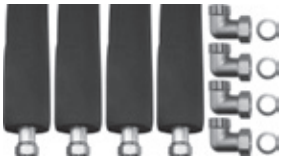
Brine/water heat pump

Hoval UltraSource® T comfort

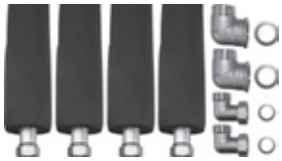
Heat pump system
Refrigerant R 410A
Max. flow temperature 65 °C

UltraSource® T comfort type	Heat output [1] B0W35 kW	W10W35 kW	Part No.
(8)	1.8-7.9	2.6-10.0	7016 666
(13)	2.9-13.3	3.7-13.2	7016 672
(17)	4.3-17.6	6.0-21.9	7016 678

[1] Modulation range



Hose set SPCH25-25-10-4 — 6058 819
for UltraSource® T cf/cp (8,13)
Consisting of:
- 4 reinforced hoses PN 10 DN 25 1″ IT
insulated for brine and heating side
flat-sealing with union nut
- Length: 1.0 m
- 4 brackets DN 25
- Seals



Hose set SPCH25-32-10-4 — 6058 820
for UltraSource® T comfort (17)
Consisting of:
- 2 reinforced hoses PN 10 DN 25 1″ IT
insulated for heating side
flat-sealing with union nut
- Length: 1.0 m
- 2 reinforced hoses PN 10 DN 32 1¼″ IT
insulated for brine side
flat-sealing with union nut
- Length: 1.0 m
- 2 brackets DN 25
- 2 brackets DN 32
- Seals

Hoval UltraSource® T compact

Heat pump system with integrated calorifier
Refrigerant R 410A
Max. flow temperature 65 °C

UltraSource® T compact type	Heat output [1] B0W35 kW	W10W35 kW	Part No.
(8/200)	1.8-7.9	2.6-10.0	7016 667
(13/200)	2.9-13.3	3.7-13.2	7016 673

[1] Modulation range

Energy efficiency class
see “Description”

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

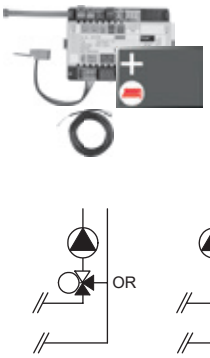
Further information
see “Description”

No hose set necessary

Electric heating elements
see “Calorifiers” -
chapter “Electric heating elements”

TopTronic® E module expansions

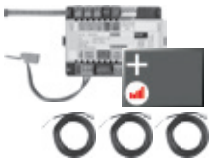
for TopTronic® E basic module heat generator

	Part No.
	6034 576

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

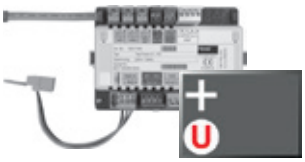
Consisting of:
- Fitting accessories
- 1 contact sensor ALF/2P/4/T, L = 4.0 m
- Basic plug set FE module

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

	6037 062

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

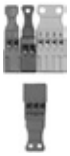
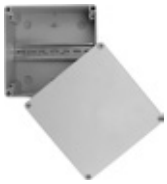
	6034 575

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.

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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”

Heating accessories

Pressure expansion tanks
see “Various system components”

Safety set SG15-1″ — Part No. 641 184
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

System water protection filter FGM025-200 — Part No. 6058 256
For horizontal installation in return
For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop
Consisting of:
- Filter head and bowl in brass
- Magnetic insert (nickel-neodymium)
- 2 pressure gauges
- Very large 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 (Δp < 0.1 bar): 5.5 m³/h
Weight: 6.8 kg
Water temperature: max. 90 °C
- incl. steam diffusion-tight insulating shells

Notice
Fulfills the function of sludge separator and strainer

Strainers
see “Various system components”

Vibration decoupler
for reducing structure-borne noise from heat pumps in the indoor area
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	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

		Part No.
	**Connection set AS32-2/H** for compact mounting of all required fittings of a direct circuit consisting of: 2 thermometer ball valves Wall bracket included separately Connection T-piece DN 32 in the return flow for connecting the sludge separator CS 32 bottom and the diaphragm pressure expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**Differential pressure relief valve DN 20** for free installation with flexible centre distance Connections at both ends 1″ external thread Operating pressure: max. 10 bar Operating temperature: max. 120 °C Setting range: 0.05-0.5 bar Length: 93 mm Casing made of brass with setting handle made of plastic	240 554
	**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

Domestic hot water accessories

	**Domestic hot water set SPW25-25-10-1MD** for UltraSource® B comfort C (8-17), Belaria® comfort ICM (8) and UltraSource® T comfort (8-17) Consisting of: - 1 actuator for installed 3-way switching ball valve for heating/ domestic hot water - 1 reinforced hose PN 10 DN 25 1″ IT insulated for domestic hot water side flat-sealing with union nut - Length: 1.0 m - Seals	6058 815
	**Correx® impressed current anode** for UltraSource® B compact C, UltraSource® T compact for long-term corrosion protection for installation in the enamelled calorifier	6046 662

Brine accessories

		Part No.
	**Instantaneous water heater kit DN 50** consisting of electrical box ready for connection for electrical protection incl. assembly fittings. for combination with all screw-in electric heating elements EP. Screw-in electric heating element must be ordered separately. Connection hoses brine already included in hose set for UltraSource® T comfort	6044 070
	**Safety group SG15-¾″** Retaining bar incl. safety valve, pressure gauge, air vent and connection fittings for expansion chambers	2015 354
	**Brine filling station in compact design DN 25** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 25 G 1″ Kvs: 12.5 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6037 537
	**Brine filling station in compact design DN 32** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 32 G 1¼″ Kvs: 22 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6033 364

Ground water accessories

Ground water pump set
Consisting of:
Protection for control of a 3-phase ground water pump. Ready to connect without thermal overload protection

	Part No.
UltraSource® T comfort (13)	6046 182
UltraSource® T compact (13)	6046 183
UltraSource® T comfort (17)	6048 004

Notice
The pump of the UltraSource® T (8) is mono-phase (230 V). Therefore, no ground water kit is required. In case of a 3-phase (400 V) ground water pump, a ground water kit is required.

Float body flow meter — Part No. 2040 707
Bistable Reed contact as NC contact
Area of application 300-3000 l/h
Temperature range 0-80 °C
Nominal pressure: 10 bar
Connection: Rp 1½″
Pressure drop: 25 mbar
Installation length: 335 mm
Max. voltage: 230 V
Max. continuous current: 0.2 A

Float body flow meter — Part No. 2040 708
Bistable Reed contact as NC contact
Area of application 600-6000 l/h
Temperature range 0-80 °C
Nominal pressure: 10 bar
Connection: Rp 1½″
Pressure drop: 25 mbar
Installation length: 335 mm
Max. voltage: 230 V
Max. continuous current: 0.2 A

Notice
In ground water applications, the ground water pump (submersible pump) cannot be directly connected in the heat pump. Here, corresponding connections must be provided on site.

Plate heat exchanger set
for system separation when using the ground water heat source
Consisting of:
- Plate heat exchanger (soldered)
- Holder for installation
- Safety group DN 15-1" insulated
- 5 litres frost protection

	Part No.
UltraSource® T comfort (8) / compact (8/200)	6058 809
UltraSource® T comfort (13) / compact (13/200)	6058 810
UltraSource® T comfort (17)	6058 811

Notice
Connection screw fittings are only included in part number 6058 811.

Passive cooling accessories

Set for passive cooling
for passive cooling via the probe or the ground water
Consisting of:
- Plate heat exchanger (screwed)
- Holder for installation
- Connection screw fittings

	Part No.
UltraSource® T comfort (8) / compact (8/200)	6058 812
UltraSource® T comfort (13) / compact (13/200)	6058 813
UltraSource® T comfort (17)	6058 814

Baking out

The baking out of buildings and floors cannot be done with brine/water heat pumps. If this instruction is not observed, the additional load can lead to irreparable damage on the heat source side. Alternative heating systems should thus be used for the baking out. This is generally done by installing an electric water heater. However, mobile heaters running on electricity, oil or gas can also be used.

More detailed information on rental devices can be obtained from Hotmobil®.

UltraSource® T comfort C (8-17)
UltraSource® T compact C (8/200), (13/200)

Type		(8) (8/200)	(13) (13/200)	(17)
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++	A+++/A+++
• Energy efficiency class load profile XL UltraSource® T compact	Hot water	A	A	-
Brine/water application B0W35				
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	209	213	226
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	158	162	164
• Water heating energy efficiency consumption profile/ηwh 35 °C/55 °C	-/%	XL/100	XL/106	-/-
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.4/4.2	5.5/4.2	5.9/4.3
Water/water application W10W35				
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	309	313	311
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	245	217	226
• Water heating energy efficiency consumption profile/ηwh 35 °C/55 °C	-/%	XL/100	XL/115	-/-
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	7.9/6.3	8.0/5.6	8.0/5.9
Max./min. performance data heating in acc. with EN 14511				
• Max. heat output B0W35	kW [3)]	7.9	13.3	17.6
• Min. heat output B0W35	kW [3)]	1.8	2.9	4.3
• Max. heat output W10W35	kW	10.0	13.2	21.9
• Min. heat output W10W35	kW	2.6	3.7	6.0
Nominal performance data heating in acc. with EN 14511				
• Nominal heat output B0W35	kW [3)]	4.1	6.6	11.4
• Coefficient of performance B0W35	COP	4.7	5.0	5.1
• Nominal heat output W10W35	kW	5.6	8.7	15.2
• Coefficient of performance W10W35	COP	6.5	6.8	6.5
Sound data				
• Sound power level (nominal)	dB(A)	45	41	44
• Sound power level (maximum)	dB(A)	51	47	55
Hydraulic data				
• Max. flow temperature (without screw-in electric heating element)	°C	62	62	62
• Max. flow temperature (with screw-in electric heating element) UltraSource® T compact	°C	65	65	-
• Max. operating pressure source side	bar	3	3	3
• Max. operating pressure on the heating side	bar	3	3	3
• Heating flow and return connection	R	1″	1″	1″
• Connections source side	R	1″	1″	1¼″
Nominal flow rate and pressure drop brine/water				
Heating (ΔT = 5 K)				
• Max. flow rate B0/W35	m^3/h	1.4	2.3	3.0
• Nominal flow rate	m^3/h	0.7	1.1	2.0
• Pressure drop	kPa	7	9	35
• Residual overpressure (max. pump speed)	kPa	69	76	47
Heat source (ΔT = 3 K)				
• Max. flow rate B0/W35	m^3/h	1.8	3.0	4.1
• Nominal flow rate	m^3/h	1.0	1.6	2.8
• Pressure drop	kPa	9	9	22
• Residual overpressure (max. pump speed)	kPa	72	76	49
Nominal flow rate and pressure drop water/water				
Heating (ΔT = 5 K)				
• Max. flow rate W10/W35	m^3/h	1.7	2.3	3.8
• Nominal flow rate	m^3/h	1.0	1.5	2.6
• Pressure drop	kPa	12	14	61
• Residual overpressure (max. pump speed)	kPa	62	78	13
Heat source (ΔT = 3 K)				
• Max. flow rate W10/W35	m^3/h	2.4	3.2	5.2
• Nominal flow rate	m^3/h	1.4	2.1	3.7
• Pressure drop UltraSource® T comfort	kPa	5	13	44
• Pressure drop UltraSource® T compact	kPa	13	44	-
• Residual overpressure (max. pump speed)	kPa	69	64	18

Type		(8) (8/200)	(13) (13/200)	(17)
Cooling technical data				
• Refrigerant		R410A	R410A	R410A
• Compressor/stages		1-modulating	1-modulating	1-modulating
• Refrigerant filling quantity	kg	2.3	3.0	3.4
• Compressor oil filling quantity	l	0.35	0.74	1.00
• Type of compressor oil		DAPHNE HERMETIC OIL FV50S	Emkarate RL32 - 3MAF	DAPHNE HERMETIC OIL FVC68D
Electrical data				
• Electrical connection compressor	V/Hz	1~230/50	3~400/50	3~400/50
• Electrical connection electric heating element UltraSource® T compact	V/Hz	1~230/50 3~400/50	3~400/50	-
• Control electrical connection	V/Hz	1~230/50	1~230/50	1~230/50
• Compressor operating current max.	A	15.8	9	14.79
• Starting current	A	< 15.8	< 9	< 14.79
• Electric heating element operating current max. UltraSource® T compact	A	13	13	-
• Max. output for electric heating element UltraSource® T compact	kW	6	6	-
• Output factor		0.99	0.97	0.95
• Main current fuse	A	16	13	16
- Type		C,K	C,K	C,K
• Control current fuse	A	13	13	13
- Type		B,Z	B,Z	B,Z
• Fuse electric heating element	A	13	13	-
- Type		B,Z	B,Z	-
Dimensions/weight				
• Dimensions (H x W x D)	mm		see Dimensions	
• Tilting dimension UltraSource® T compact	mm	2150	2150	-
• Weight UltraSource® T comfort	kg	165	170	196
• Weight UltraSource® T compact	kg	265	270	-
• Minimum sizes of installation room [4]	m^3	5.2	6.8	8.6
Hot water storage tank UltraSource® T compact				
• Storage capacity	l	192	192	-
• Max. operating pressure	bar	10	10	-
• Storage tank temperature max.	°C	55	55	-
• Maximum storage tank temperature with electric heating element	°C	75	75	-
• Output capacity at 46 °C draw-off temperature - heat pump (= Tsp = 58°)[5]				
• Output capacity at 40 °C draw-off temperature - heat pump (= Tsp = 58°)[5]				

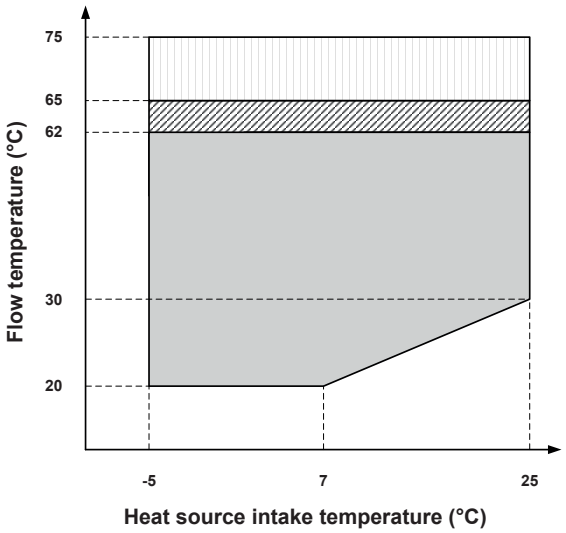
[1] 2 % can be added for class II heat pump incl. control.
[2] 4 % can be added for class IV heat pump incl. control and room thermostat.
[3] kW = Standard values according to EN 14511; Values for B0W35 with 25 % monopolypropylene
[4] If the installation room is smaller than the required minimum size. it must be designed as a machine room in accordance with EN 378.
[5] 12 °C cold water temperature/58 °C storage tank temperature

Using a fault-current circuit breaker RCCB type B, IΔn ≥ 300 mA is recommended. Country-specific regulations must be observed.

Diagrams of areas of application

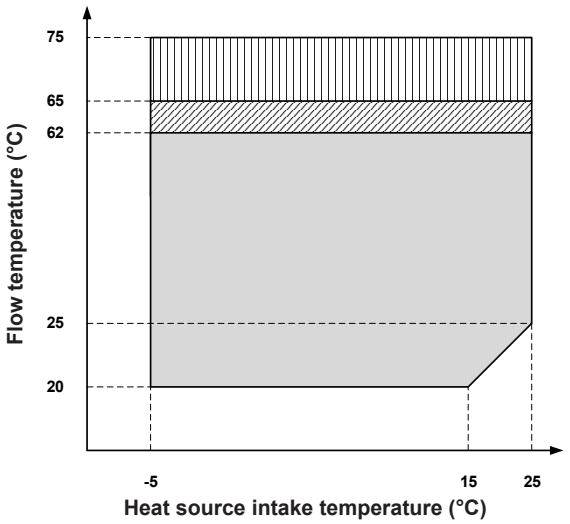
Heating and hot water

UltraSource® T comfort (8), UltraSource® T compact (8/200)



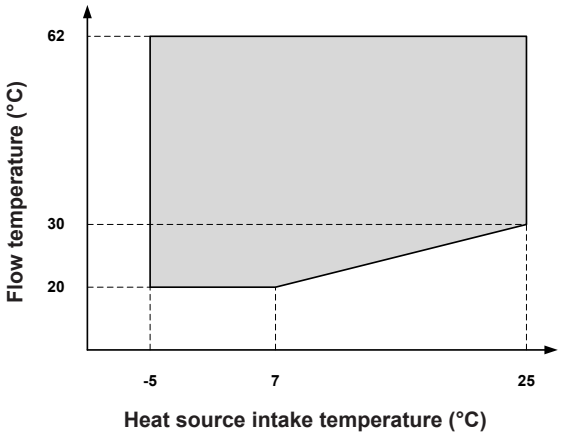
- Area of application of the heat pump for heating (UltraSource® T comfort C and compact C)
- Extended area of application of the heat pump for heating including electric heating element (only UltraSource® T compact)
- Extended area of application of the heat pump for domestic hot water including electric heating element (only UltraSource® T compact)

UltraSource® T comfort (13), UltraSource® T compact (13/200)



- Area of application of the heat pump for heating (UltraSource® T comfort C and compact C)
- Extended area of application of the heat pump for heating including electric heating element (only UltraSource® T compact)
- Extended area of application of the heat pump for domestic hot water including electric heating element (only UltraSource® T compact)

UltraSource® T comfort (17)



- Area of application of the heat pump for heating (UltraSource® T comfort C and compact C)

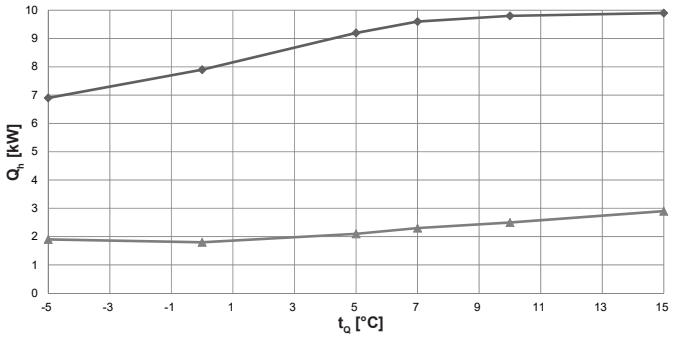
Performance data – heating

Maximum heat output

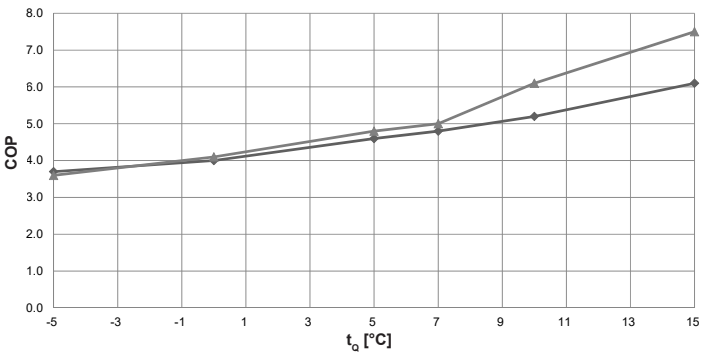
UltraSource® T comfort (8), compact (8/200) with R410A

Data according to EN 14511

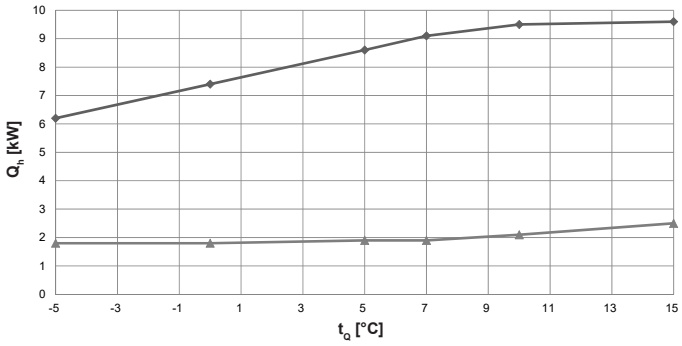
Heat output - t_{VL} 35 °C



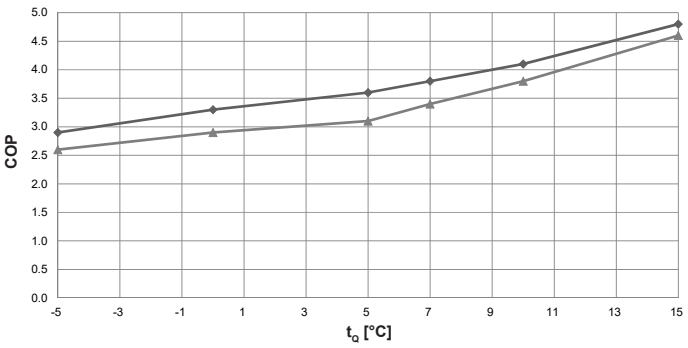
Coefficient of performance - t_{VL} 35 °C



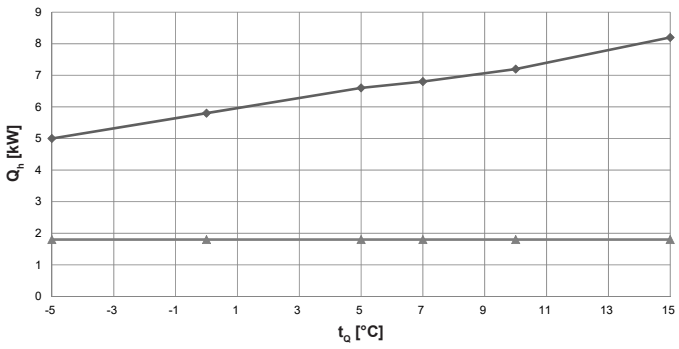
Heat output - t_{VL} 45 °C



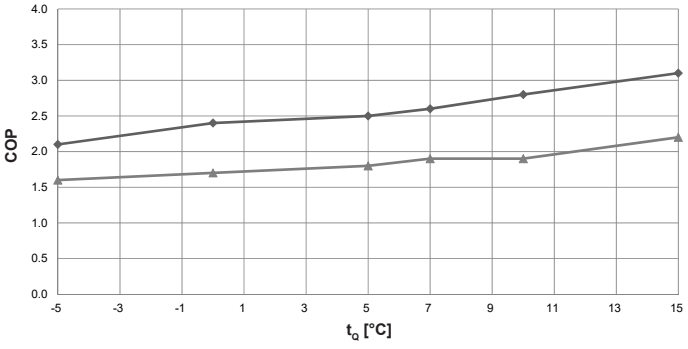
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Coefficient of performance - t_{VL} 62 °C



t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

Maximum output
Minimum output

Performance data – heating

UltraSource® T comfort (8), compact (8/200) with R410A

Data according to EN 14511

Type flow t_{VL} (°C)		t_Q °C	Maximum output Q_h kW	P kW	COP	Minimum output Q_h kW	P kW	COP
35	Brine	-5	6.9	1.9	3.7	1.9	0.5	3.6
		0	7.9	1.9	4.0	1.8	0.4	4.1
		5	9.2	2.0	4.6	2.1	0.4	4.8
		7	9.6	2.0	4.8	2.3	0.5	5.0
		10	9.8	1.9	5.2	2.5	0.4	6.1
		15	9.9	1.6	6.1	2.9	0.4	7.5
	Water	7	9.8	1.9	5.2	2.4	0.4	5.5
		10	10.0	1.8	5.5	2.6	0.4	6.7
		15	10.1	1.6	6.4	3.0	0.4	8.3
45	Brine	-5	6.2	2.1	2.9	1.8	0.7	2.6
		0	7.4	2.3	3.3	1.8	0.6	2.9
		5	8.6	2.4	3.6	1.9	0.6	3.1
		7	9.1	2.4	3.8	1.9	0.6	3.4
		10	9.5	2.3	4.1	2.1	0.6	3.8
		15	9.6	2.0	4.8	2.5	0.5	4.6
	Water	7	9.2	2.3	3.9	2.0	0.5	3.8
		10	9.8	2.3	4.3	2.3	0.5	4.2
		15	9.9	2.0	5.1	2.6	0.5	5.1
50	Brine	-5	5.9	2.3	2.6	1.8	0.8	2.3
		0	7.0	2.5	2.9	1.8	0.7	2.5
		5	8.2	2.6	3.2	1.8	0.7	2.6
		7	8.6	2.6	3.3	1.8	0.6	2.9
		10	9.2	2.6	3.5	2.0	0.6	3.3
		15	9.4	2.2	4.2	2.4	0.6	4.0
	Water	7	8.9	2.6	3.4	1.9	0.6	3.1
		10	9.6	2.5	3.8	2.1	0.6	3.4
		15	9.7	2.2	4.4	2.4	0.6	4.1
55	Brine	-5	5.4	2.2	2.5	1.8	0.9	2.0
		0	6.3	2.3	2.8	1.8	0.9	2.1
		5	7.2	2.4	3.0	1.8	0.8	2.3
		7	7.5	2.4	3.1	1.9	0.8	2.4
		10	8.0	2.4	3.3	1.8	0.7	2.5
		15	9.1	2.5	3.7	2.2	0.7	3.1
	Water	7	8.0	2.4	3.3	2.0	0.7	2.6
		10	8.6	2.5	3.4	1.9	0.7	2.8
		15	9.5	2.6	3.7	2.3	0.7	3.4
62	Brine	-5	5.0	2.4	2.1	1.8	1.1	1.6
		0	5.8	2.5	2.4	1.8	1.1	1.7
		5	6.6	2.6	2.5	1.8	1.0	1.8
		7	6.8	2.6	2.6	1.8	1.0	1.9
		10	7.2	2.6	2.8	1.8	1.0	1.9
		15	8.2	2.6	3.1	1.8	0.8	2.2
	Water	7	7.4	2.7	2.7	1.9	1.0	1.9
		10	8.0	2.8	2.9	1.9	0.9	2.1
		15	9.0	2.8	3.2	1.9	0.8	2.4

t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
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”

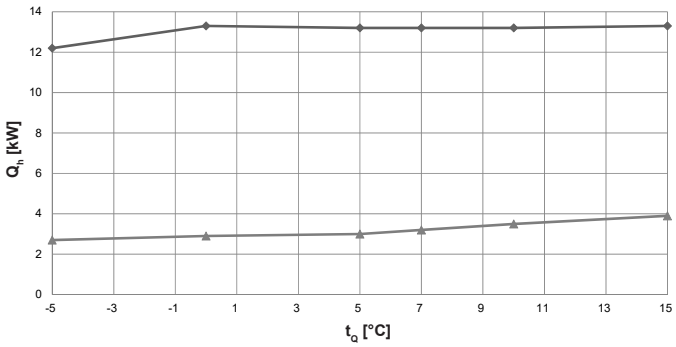
Performance data – heating

Maximum heat output

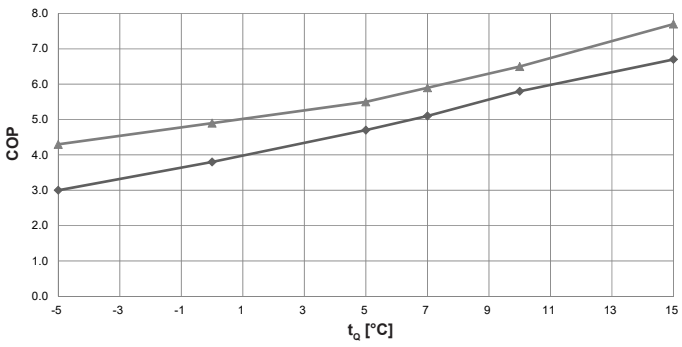
UltraSource® T comfort (13), compact (13/200) with R410A

Data according to EN 14511

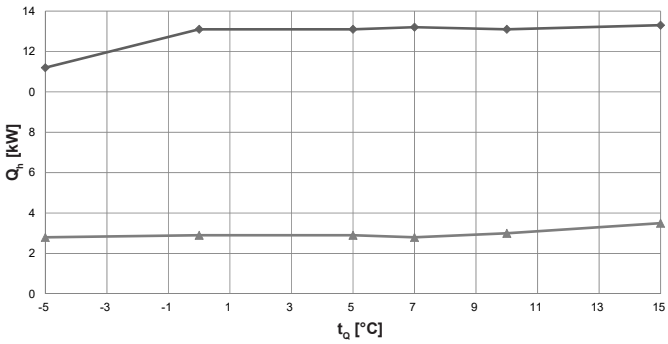
Heat output - t_{VL} 35 °C



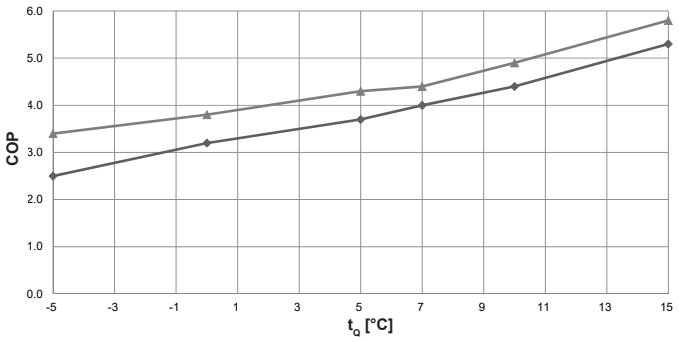
Coefficient of performance - t_{VL} 35 °C



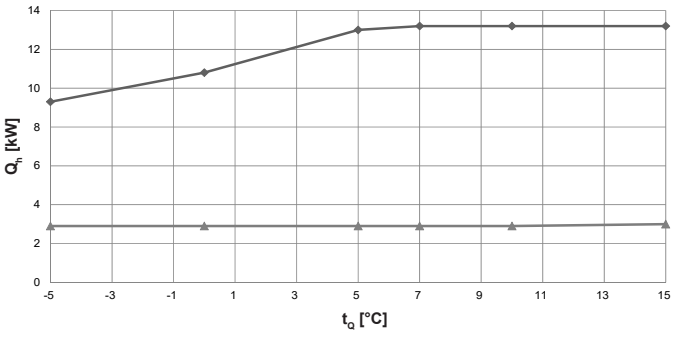
Heat output - t_{VL} 45 °C



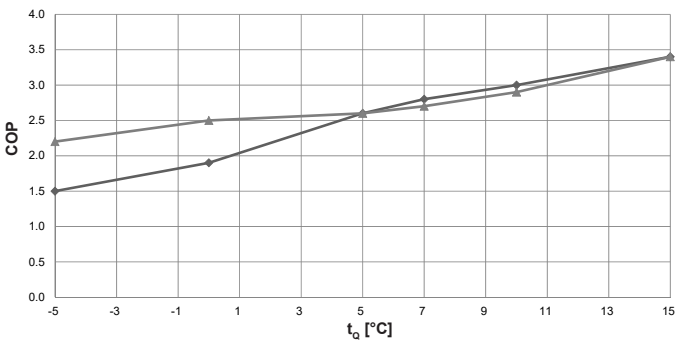
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Coefficient of performance - t_{VL} 62 °C



t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

Maximum output
Minimum output

Performance data – heating

UltraSource® T comfort (13), compact (13/200) with R410A

Data according to EN 14511

Type flow t_{VL} (°C)		t_Q °C	Maximum output Q_h kW	P kW	COP	Minimum output Q_h kW	P kW	COP
35	Brine	-5	12.2	4.0	3.0	2.7	0.6	4.3
		0	13.3	3.5	3.8	2.9	0.6	4.9
		5	13.2	2.8	4.7	3.0	0.5	5.5
		7	13.2	2.6	5.1	3.2	0.5	5.9
		10	13.2	2.3	5.8	3.5	0.5	6.5
		15	13.3	2.0	6.7	3.9	0.5	7.7
	Water	7	13.2	2.5	5.3	3.4	0.6	6.1
		10	13.2	2.2	6.0	3.7	0.6	6.7
		15	13.3	1.9	6.9	4.1	0.5	7.9
45	Brine	-5	11.2	4.4	2.5	2.8	0.8	3.4
		0	13.1	4.2	3.2	2.9	0.7	3.8
		5	13.1	3.6	3.7	2.9	0.7	4.3
		7	13.2	3.3	4.0	2.8	0.6	4.4
		10	13.1	3.0	4.4	3.0	0.6	4.9
		15	13.3	2.5	5.3	3.5	0.6	5.8
	Water	7	13.2	3.2	4.2	3.0	0.6	4.7
		10	13.1	2.8	4.6	3.2	0.6	5.1
		15	13.3	2.4	5.5	3.6	0.6	5.9
50	Brine	-5	10.6	4.8	2.2	2.9	0.9	3.2
		0	12.4	4.6	2.7	2.9	0.8	3.5
		5	13.3	4.1	3.3	3.0	0.7	4.0
		7	13.2	3.7	3.5	2.9	0.7	4.1
		10	13.1	3.4	3.9	2.9	0.7	4.5
		15	13.3	2.9	4.6	3.2	0.6	5.0
	Water	7	13.2	3.5	3.8	3.0	0.7	4.4
		10	13.1	3.2	4.1	3.1	0.7	4.7
		15	13.3	2.7	4.8	3.4	0.6	5.3
55	Brine	-5	10.1	5.7	1.8	2.9	1.0	2.8
		0	11.9	5.2	2.3	2.9	1.0	3.0
		5	13.2	4.5	3.0	2.9	0.8	3.4
		7	13.2	4.2	3.2	2.8	0.8	3.5
		10	13.1	3.8	3.5	2.8	0.7	3.8
		15	13.2	3.3	4.1	3.1	0.7	4.4
	Water	7	13.2	3.9	3.4	3.0	0.8	3.7
		10	13.1	3.6	3.7	3.0	0.8	4.0
		15	13.2	3.1	4.3	3.3	0.7	4.5
62	Brine	-5	9.3	6.3	1.5	2.9	1.3	2.2
		0	10.8	5.8	1.9	2.9	1.2	2.5
		5	13.0	5.0	2.6	2.9	1.1	2.6
		7	13.2	4.7	2.8	2.9	1.0	2.7
		10	13.2	4.4	3.0	2.9	1.0	2.9
		15	13.2	3.9	3.4	3.0	0.9	3.4
	Water	7	13.2	4.4	3.0	2.9	1.0	3.0
		10	13.2	4.2	3.2	3.0	1.0	3.1
		15	13.2	3.7	3.6	3.2	0.9	3.5

t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
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”

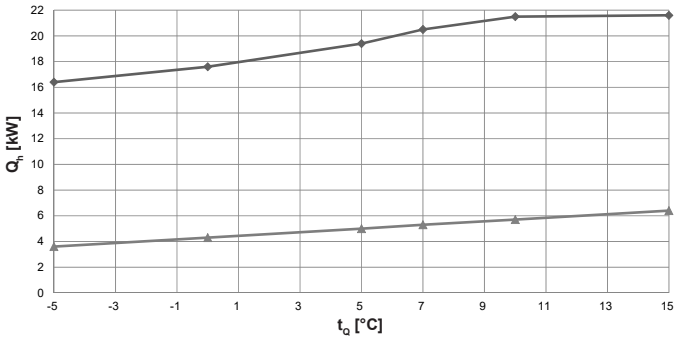
Performance data – heating

Maximum heat output

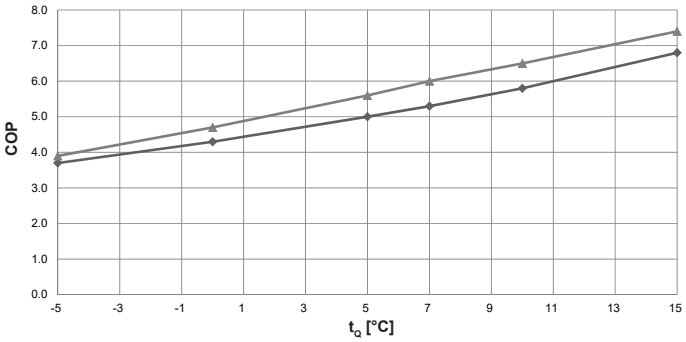
UltraSource® T comfort (17) with R410A

Data according to EN 14511

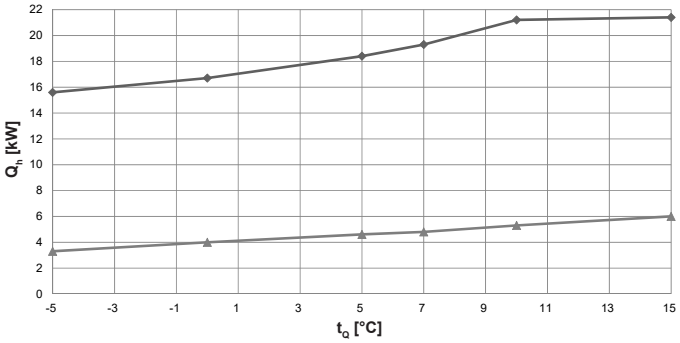
Heat output - t_{VL} 35 °C



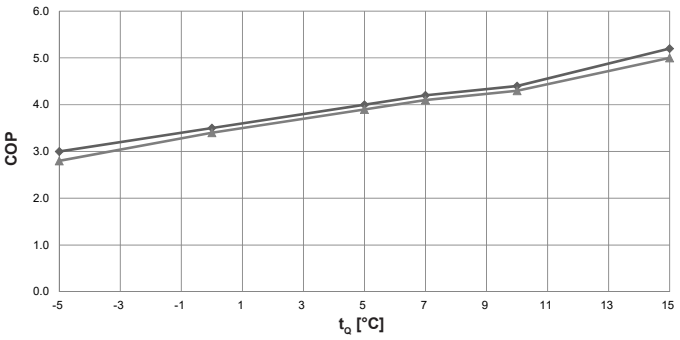
Coefficient of performance - t_{VL} 35 °C



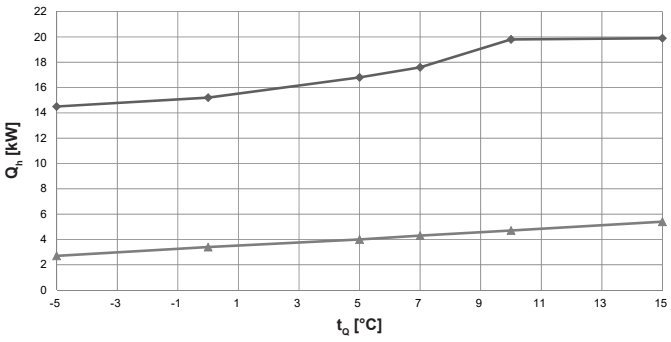
Heat output - t_{VL} 45 °C



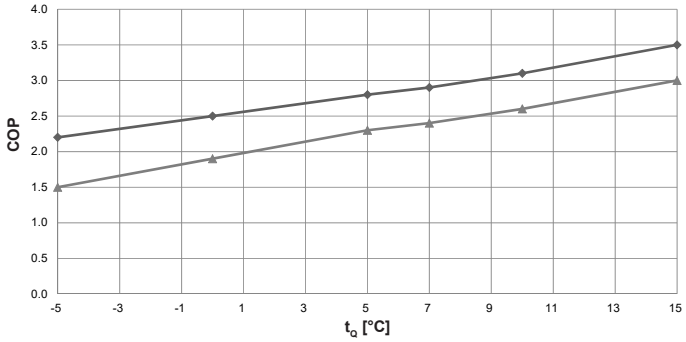
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Coefficient of performance - t_{VL} 62 °C



t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

Maximum output
Minimum output

Performance data – heating

UltraSource® T comfort (17) with R410A

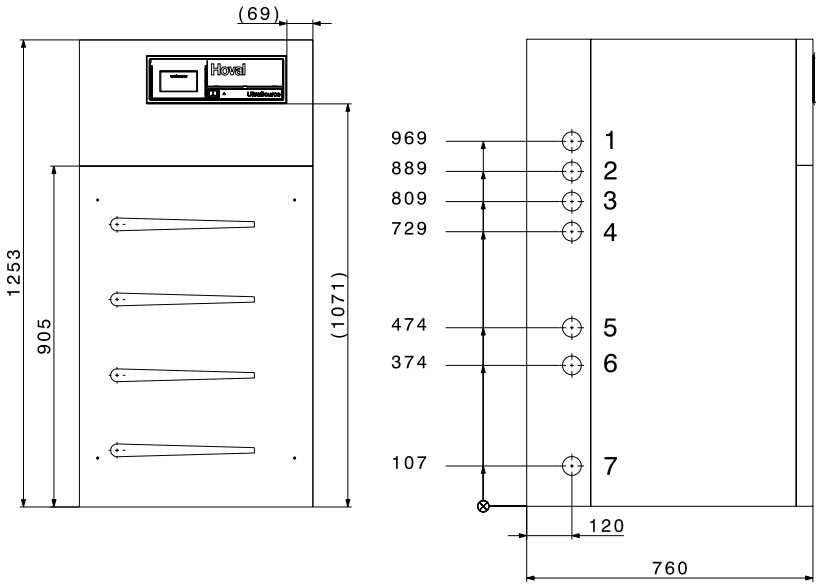
Data according to EN 14511

Type flow t_{VL} (°C)		t_Q °C	Maximum output Q_h kW	P kW	COP	Minimum output Q_h kW	P kW	COP
35	Brine	-5	16.4	4.5	3.7	3.6	0.9	3.9
		0	17.6	4.1	4.3	4.3	0.9	4.7
		5	19.4	3.8	5.0	5.0	0.9	5.6
		7	20.5	3.9	5.3	5.3	0.9	6.0
		10	21.5	3.7	5.8	5.7	0.9	6.5
		15	21.6	3.2	6.8	6.4	0.9	7.4
	Water	7	20.5	3.7	5.6	5.4	0.9	6.4
		10	21.9	3.9	5.7	6.0	0.8	7.1
		15	22.5	3.4	6.6	6.9	0.8	8.7
45	Brine	-5	15.6	5.2	3.0	3.3	1.2	2.8
		0	16.7	4.8	3.5	4.0	1.2	3.4
		5	18.4	4.6	4.0	4.6	1.2	3.9
		7	19.3	4.6	4.2	4.8	1.2	4.1
		10	21.2	4.8	4.4	5.3	1.2	4.3
		15	21.4	4.1	5.2	6.0	1.2	5.0
	Water	7	19.6	4.8	4.1	5.0	1.1	4.4
		10	21.6	5.0	4.3	5.4	1.1	4.7
		15	21.8	4.2	5.1	6.3	1.1	5.6
50	Brine	-5	15.2	5.6	2.7	3.1	1.3	2.4
		0	16.2	5.2	3.1	3.8	1.3	2.9
		5	17.7	5.0	3.5	4.4	1.3	3.4
		7	18.7	5.0	3.7	4.7	1.3	3.6
		10	20.7	5.3	3.9	5.1	1.4	3.7
		15	21.0	4.6	4.6	5.8	1.4	4.2
	Water	7	19.3	4.9	3.9	4.8	1.3	3.8
		10	21.1	5.3	4.0	5.3	1.3	4.1
		15	21.3	4.6	4.6	6.2	1.3	4.9
55	Brine	-5	15.0	5.9	2.6	2.9	1.5	1.9
		0	15.8	5.5	2.9	3.5	1.5	2.3
		5	17.3	5.3	3.2	4.2	1.5	2.9
		7	18.1	5.4	3.4	4.5	1.5	3.0
		10	20.2	5.6	3.6	4.9	1.5	3.2
		15	20.3	4.8	4.2	5.6	1.5	3.7
	Water	7	18.9	5.3	3.6	4.6	1.5	3.2
		10	20.6	5.7	3.6	5.2	1.5	3.5
		15	20.7	5.2	4.0	6.0	1.4	4.2
62	Brine	-5	14.5	6.7	2.2	2.7	1.8	1.5
		0	15.2	6.2	2.5	3.4	1.8	1.9
		5	16.8	6.1	2.8	4.0	1.8	2.3
		7	17.6	6.1	2.9	4.3	1.8	2.4
		10	19.8	6.4	3.1	4.7	1.8	2.6
		15	19.9	5.7	3.5	5.4	1.8	3.0
	Water	7	17.4	6.1	2.9	4.0	1.8	2.2
		10	20.1	6.7	3.0	4.5	1.8	2.5
		15	20.3	5.9	3.4	5.4	1.8	3.0

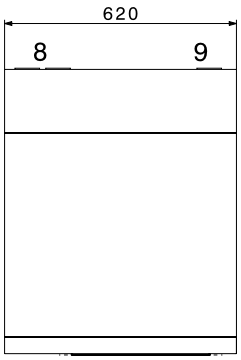
t_{VL} = heating flow temperature (°C)
t_Q = source temperature (°C)
Q_h = heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
P = power consumption, overall unit (kW)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

Observe daily power interruptions!
see “Engineering heat pumps general”

UltraSource® T comfort (8-17)
Indoor unit
(Dimensions in mm)



View from above

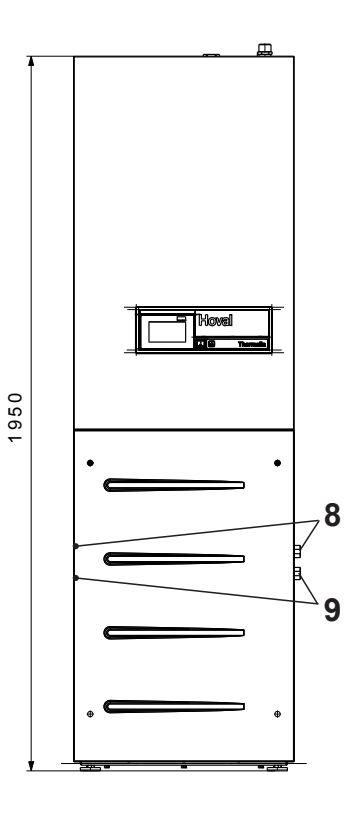


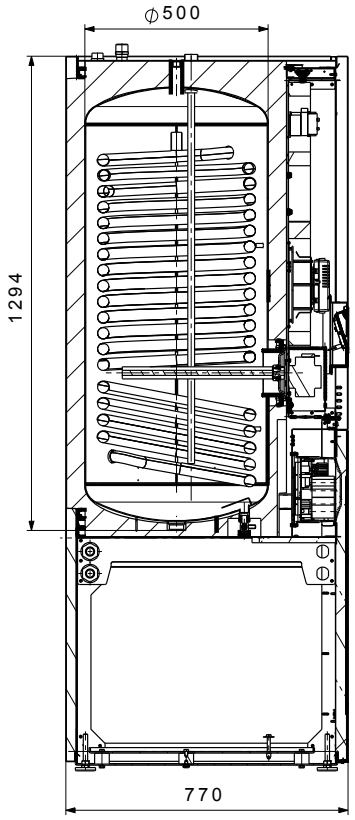
Connections (1-7) on either the left or right side

1	Free	
2	Brine outlet 1″	(8,13) 1″ (17) 1¼″
3	Flow heating 1″	
4	Flow hot water charging 1″	
5	Brine inlet	(8,13) 1″ (17) 1¼″
6	Free	
7	Return heating 1″	
8	Cable feed-in main current	
9	Cable feed-in sensors	

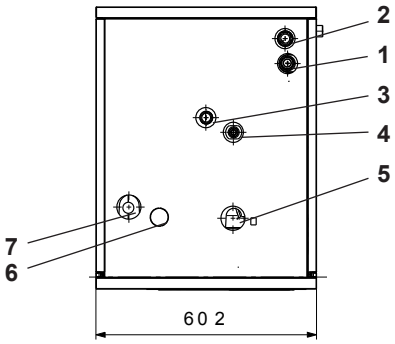
The indoor unit must be accessible from above.

UltraSource® T compact (8,13/200)
Indoor unit with calorifier
(Dimensions in mm)





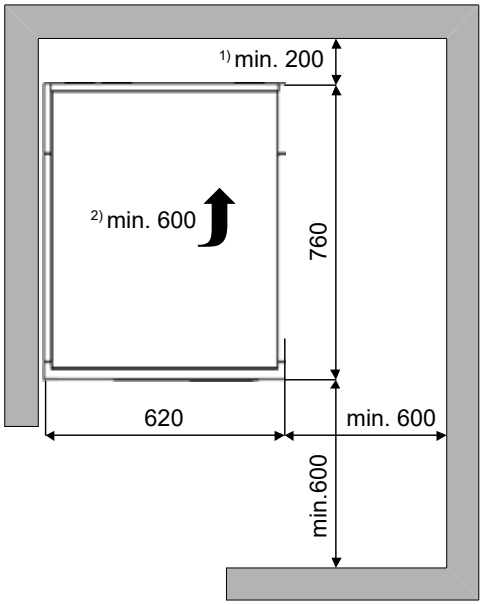
View from above



1	Flow heating 1″
2	Return heating 1″
3	Hot water connection ¾″
4	Cold water connection ¾″
5	Cable feed-in sensors
6	Circulation connection ¾″
7	Cable feed-in main current
8	Brine entry (connection right or left) 1″
9	Brine exit (connection right or left) 1″

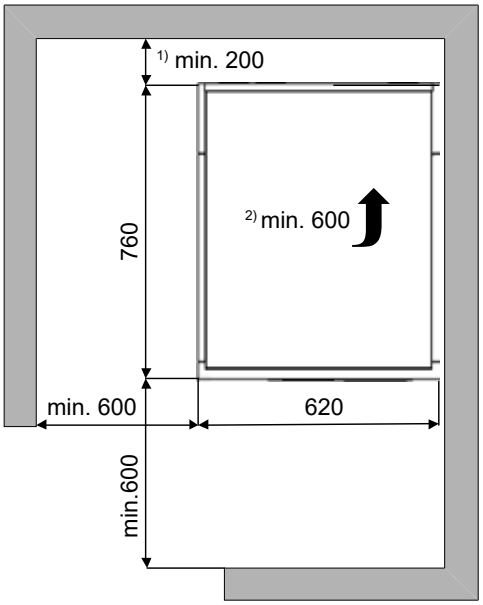
Space requirement
(Dimensions in mm)

UltraSource® T comfort (8-17) left
Indoor unit



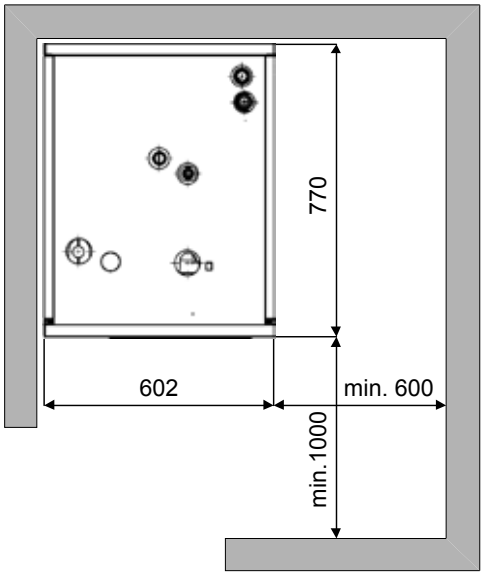
[1] A gap of at least 200 mm must be guaranteed at the rear for the electrical connection.

UltraSource® T comfort (8-17) right
Indoor unit



[2] To ensure accessibility to the electrical connections, a clearance of at least 600 mm must be provided **above** the UltraSource® T comfort C (8-17)!

UltraSource® T compact (8,13/200)
Indoor unit



Due to the need for access to the 3-way switching ball valve for heating and domestic hot water, a gap of at least 600 mm must be guaranteed on the right side.

Requirements and directives
The general requirements and directives listed in the Chapter Engineering apply.

Set-up
- The UltraSource® T comfort and UltraSource® T compact must be installed in a room protected against frost, by an approved specialist company.
  Room temperature must be between 5 °C and 25 °C.
- If the installation room is smaller than the required minimum size, it must be designed as a machine room in accordance with the provisions of EN 378.
- Installation in wet rooms, dusty rooms or rooms with a potentially explosive atmosphere is not permitted.
- To minimise vibration and noise inside the building, heat pumps should be isolated as well as possible from the building structure. For example heat pumps should never be installed on lightweight ceilings/floor. In the case of floating screed, a recess should be cut in the screed and the impact sound insulation around the heat pump.
- The connections for the brine flow and return in the UltraSource® T comfort and in the UltraSource® T compact can be on either the left or right side.
- The connections for the heating flow and return in the UltraSource® T comfort can be on either the left or right and in the UltraSource® T compact they are on the top.
- The connections for hot and cold water as well as hot water circulation are located on top of the UltraSource® T compact.
- The applicable laws, regulations and standards have to be observed, in particular EN 378 Parts 1 and 2 as well as BGR 500.
- A gap of at least 600 mm must be observed for maintenance work on the front and, depending on where the brine lines are connected, on the right or left side of the heat pump (see dimensions/space required). On the front of the UltraSource® T compact (8,13/200), the minimum distance to be maintained is 1000 mm.
- 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.

It is imperative that a system water protection filter is installed in the heating return upstream from the heat pump.

Installation on heating side
- All pertinent laws, regulations and standards for building heating system pipework and for heat pump systems must be complied with.
- 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.
- Ventilation possibilities must be provided at the highest point and drainage possibilities at the lowest points of the connecting lines.
- To prevent energy losses, the connecting lines must be insulated with suitable material.

Installation on brine side
- The connection fittings for the brine line of the UltraSource® T comfort are located in the heat pump and can be pulled out either to the left or right through the openings provided.
- The connection fittings for the brine line of the UltraSource® T compact are located on the right side when delivered. If necessary, the brine line connections can also be taken out on the left side of the heat pump. The connections for the brine line are changed over on site. If the brine line connections are changed to the left, the hose of the brine entry line (upper line) must be shortened from 450 mm to 285 mm. Once the connection line has been shortened, it must be insulated again with Armaflex.

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 rating 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 should be installed if the water is hard.

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 dimensions 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 pumps.
- This fault-current circuit breaker must be of the all-current-sensitive type B (IΔN ≥ 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 connecting and feeder lines must be copper cables.
- Please refer to the wiring diagram for electrical details.

For other engineering notices and guidelines regarding probes, flat plate collectors or ground water use,
see “Engineering”

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

Hoval Thermalia® comfort

Heat pump system for heating in the living area.

- Compact floor-standing brine/water or water/water heat pumps
- Stable casing made of powder-coated sheet steel with removable and sound-insulated side walls
  Colour brown red (RAL 3011)
- Front made of powder-coated sheet steel, removable and sound-insulated
  Colour flame red (RAL 3000)
- Acoustically insulated casing with triple mounting of the compressor
- Sound-insulated floor mat
- Spiral (scroll) compressor
- Evaporator and plate-type condenser made of stainless steel/copper
- Electronic expansion valve
- Electronic starting current limiter with rotating field and phase monitoring
- Speed-controlled, highly efficient heating and brine pump
- 3-way switching ball valve for heating/domestic hot water with drive
- Integrated brine pressure monitoring
- Hydraulic connections at rear:
  Thermalia® comfort (8-17): 1″
  Thermalia® comfort H (7,10): 1″
- TopTronic® E control installed
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery.
- Heat pump delivered pre-wired and ready for connection
- Electrical connections at rear
- Refrigerant:
  Thermalia® comfort (8-17): R410A
  Thermalia® comfort H (7,10): R134a
- Brine connections at rear:
  Thermalia® comfort (8-17): 1″
  Thermalia® comfort H (7,10): 1″

Model range

Thermalia® comfort type	Water/water 35 °C	Water/water 55 °C	Brine/water 35 °C	Brine/water 55 °C	Refrigerant	Max. flow °C	Heat output B0W35 kW	Heat output W10W35 kW
(8)	A+++	A+++	A+++	A++	R410A	62	7.6	9.6
(10)	A+++	A+++	A+++	A++	R410A	62	10.6	12.7
(13)	A+++	A+++	A+++	A++	R410A	62	13.4	17.5
(17)	A+++	A+++	A+++	A++	R410A	62	17.2	22.3
H (7)	A+++	A+++	A+++	A++	R134a	67	6.5	9.1
H (10)	A+++	A+++	A+++	A++	R134a	67	9.1	12.8

Energy efficiency class of the compound system with control

TopTronic® E controller

Control panel

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

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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

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
  - Universal module expansion or
  - Heat balancing module expansion
- 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

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

For further information about the TopTronic® E,
see “Controls” section

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 free 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
- One-piece design. Compact unit wired-up internally ready for connection, supplied fully packaged
- Sensor set supplied loose

Options
- Connection set heating
- Connection set domestic hot water

Brine/water-water/water heat pump

Hoval Thermalia® comfort

Refrigerant R410A

Flow temperature max. 62 °C

Thermalia® comfort type	Heat output with B0W35 kW	with W10W35 kW	Part No.
(8)	7.6	9.6	7018 562
(10)	10.6	12.7	7018 563
(13)	13.4	17.5	7018 564
(17)	17.2	22.3	7018 565

Hoval Thermalia® comfort H

Refrigerant R410A

Flow temperature max. 67 °C

Thermalia® comfort type	Heat output with B0W35 kW	with W10W35 kW	Part No.
(7)	6.5	9.1	7018 566
(10)	9.1	12.8	7018 567

Energy efficiency class
see Description

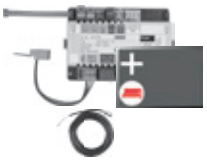
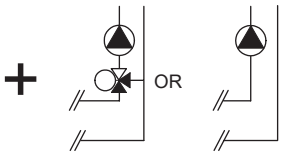
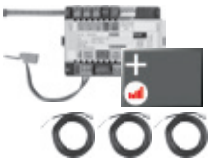
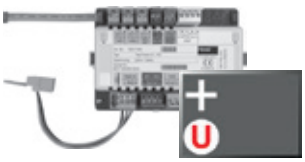
Electric heating elements
see “Calorifiers” - chapter “Electric heating elements”

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

Further information
see “Description”

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
 	**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!	6034 576
	**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** Suitable flow rate sensors (pulse sensors) must be provided on site.	6037 062
	**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	6034 575

Flow rate sensor sets
Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 8	G ¾″	0.9-15	6038 526
DN 10	G ¾″	1.8-32	6038 507
DN 15	G 1″	3.5-50	6038 508
DN 20	G 1¼″	5-85	6038 509
DN 25	G 1½″	9-150	6038 510

Brass housing

Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950
DN 40	G 2 ″	22-400	6055 092

Notice:
With the flow sensors, heat balancing is possible via TopTronic® E module expansion.

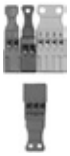
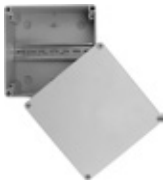
Flow rate sensor sets
Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 20	G 1¼″	5-85	6060 598

Notice:
With the flow sensors, heat balancing is possible via the automatic heat pump device.

Notice:
The flow rate sensor set must be installed without fail. Freezing can be prevented with the help of flow rate sensors and further technical measures. In order to protect the heat pump from frost in the event of a power failure or for example in bivalence mode, a system separation or other technical measures must be provided on site.

Accessories for TopTronic® E

		Part No.
	**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**	6039 253
	one SD card required per control module Consisting of the following languages: HU, CS, SL, RO, PL, TR, ES, HR, SR, JA, DA	
	**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
	**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

	Part No.
 **Hose set SCH25-25-12-4** for Thermalia® comfort (8-13) and Thermalia® comfort H (7,10) Consisting of: - 4 reinforced hoses PN 10 DN 25 1″ IT insulated for brine and heating side flat-sealing with union nut - Length: 1.2 m - 4 brackets DN 25 - Seals	6055 133
 **Hose set SCH25-32-12-4** for Thermalia® comfort (17) Consisting of: - 4 reinforced hoses PN 10 DN 32 1¼″ IT insulated for brine and heating side flat-sealing with union nut - Length: 1.2 m - 4 brackets DN 32 - Seals	6055 134

Accessories for water heating

	Part No.
 **Domestic hot water set SW25-25-12-1** for Thermalia® comfort (8-17) and Thermalia® comfort H (7,10) Consisting of: - 1 reinforced hose PN 10 DN 25 1″ IT insulated for domestic hot water side flat-sealing with union nut - Length: 1.2 m - 2 brackets DN 25 - Seals	6055 122
 **System water protection filter FGM025-200** For horizontal installation in return For filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop Consisting of: - Filter head and bowl in brass - Magnetic insert (nickel-neodymium) - 2 pressure gauges - Very large 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 (Δp < 0.1 bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C - incl. steam diffusion-tight insulating shells	6058 256

Notice
Fulfills the function of sludge separator and strainer

Further strainers
see “Various system components”

Accessories

Vibration decoupler
for reducing structure-borne noise
from heat pumps in the indoor area
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	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Circulating pumps, actuators, buffer storage tanks etc.,
see separate brochures

Necessary at boiler room temperatures < 10 °C

Crankcase heater — 6019 718
for Belaria® twin I/IR (20-30),
Thermalia® comfort (8-17),
Thermalia® comfort H (7,10),
Thermalia® twin (20-42),
Thermalia® twin H (13-22)
Necessary for heating
room temperatures < 10 °C
for protecting the compressor
For Belaria® twin I/IR
2 pieces are necessary

Instantaneous water heater kit DN 50 — 6044 070
consisting of electrical box ready
for connection for electrical
protection incl. assembly fittings.
for combination with all
screw-in electric heating elements EP.
Screw-in electric heating element
must be ordered separately.

		Part No.
	**Ground water immersion sensor TF/1.1P/5S/5T/H-WP L = 5 m silicone** Ground water sensor for heat pumps, Cable length: 5 m (silicone) without plug Sensor sleeve diameter: 5 x 60 mm Unaffected by condensation Sensor characteristic: PT1000 Circuit board construction Double-curved contact-pressure spring Operating temperature: -50…200 °C Protection class: IP65	6048 378
	**Immersion sensor TF/1.1P/2.5/6T, L = 2.5 m FW** for TopTronic® E basic module district heating/fresh water, basic module district heating com Sensor for district heating applications (PT1000) Cable length: 2.5 m without plug (plug supplied with controller module/ module expansion) Sensor sleeve diameter: 6 x 50 mm Dewpoint-proof Sensor may already be included in scope of supply of heat generator/controller module/module expansion Operating temperature: -50…105 °C Protection class: IP67	2056 777
	Accessories water/water	
	**Frost protection concentrate PowerCool DC 924-PXL** on basis propylene glycol completely mixable with water with corrosion protection Frost protection: -20 °C with 40 % mixture ratio Content plastic container: 10 kg	2009 987
	**Brine filling station in compact design DN 25** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 25 G 1″ Kvs: 12.5 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6037 537
	**Brine filling station in compact design DN 32** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 32 G 1¼″ Kvs: 22 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6033 364

Notice
For ground water applications, the ground water pump (submersible pump) can not be directly connected to the heat pump. Corresponding on-site connections must be provided here.

		Part No.
	**Float body flow meter** Bistable Reed contact as NC contact Area of application 300-3000 l/h Temperature range 0-80 °C Nominal pressure: 10 bar Connection: Rp 1½″ Pressure drop: 25 mbar Installation length: 335 mm Max. voltage: 230 V Max. continuous current: 0.2 A	2040 707
	**Float body flow meter** Bistable Reed contact as NC contact Area of application 600-6000 l/h Temperature range 0-80 °C Nominal pressure: 10 bar Connection: Rp 1½″ Pressure drop: 25 mbar Installation length: 335 mm Max. voltage: 230 V Max. continuous current: 0.2 A	2040 708
	**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

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.

Thermalia® comfort (8-17) with R410A

Type		(8)	(10)	(13)	(17)
Brine/water application B0W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	A+++/A++	A+++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	176	191	192	190
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	125	133	139	140
Water/water application W10W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	231	245	255	240
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	161	170	181	173
• Seasonal coefficient of performance moderate climate (brine) 35 °C/55 °C	SCOP	4.6/3.3	5.0/3.5	5.0/3.7	5.0/3.7
Max. performance data heating in acc. with EN 14511					
• Heat output B0W35	kW [3)]	7.6	10.6	13.4	17.2
• Coefficient of performance B0W35	COP	4.6	4.8	4.8	4.7
• Heat output W10W35	kW	9.6	12.7	17.5	22.3
• Coefficient of performance W10W35	COP	5.9	6.1	6.3	5.9
Nominal volume flow rate and pressure drop brine/water					
Heating (ΔT = 5 K)	m^3/h	1.0	1.4	1.8	2.3
• ΔP Pressure drop condenser	kPa	7	8	9	10
• Residual overpressure	kPa	63	49	56	41
Heat source (ΔT = 3 K)	m^3/h	1.8	2.5	3.2	4.1
• ΔP Pressure drop evaporator (glycol)	kPa	16	19	21	19
• Residual overpressure	kPa	59	67	91	93
Nominal volume flow rate and pressure drop water/water					
Heating (ΔT = 5 K)	m^3/h	1.7	2.2	3.0	3.9
• ΔP Pressure drop condenser	kPa	11	12	16	14
• Residual overpressure	kPa	49	36	34	21
Heat source (ΔT = 5 K) [4)]	m^3/h	1.4	1.8	2.5	3.2
• ΔP Pressure drop evaporator	kPa	9	10	15	12
• Residual overpressure	kPa	81	98	101	105
Operating limit values					
• Heating		see diagrams of areas of application			
• Hot water		see diagrams of areas of application			
• Operating pressure max. water side	bar	6	6	6	6
• Operating pressure max. brine side	bar	6	6	6	6
• Installation place operation [5)]	°C (min./max.)	5/35	5/35	5/35	5/35
• Storage	°C (min./max.)	-15/46	-15/46	-15/46	-15/46
• Compressor, type		1 x spiral (scroll), hermetic			
• Refrigerant filling quantity (R410A)	kg	1.6	1.9	2.1	2.4
- Type of compressor oil: EMKARATE RL 32-3MAF					
• Condenser/evaporator		Plate heat exchanger			
• Material		Stainless steel V4A, AISI 316, 1.4401			
• Pipe connections at rear	G	1″	1″	1″	1″

Type		(8)	(10)	(13)	(17)
Electrical data [6]					
• Voltage	V	3~400	3~400	3~400	3~400
• Frequency	Hz	50	50	50	50
• Voltage range	V	380-420	380-420	380-420	380-420
• Max. compressor operating current	A	6.2	7.4	9.7	13
• Starting current with starting current limiter [7]	A	12.4	14.8	19.4	26
• Principal current (external protection) with brine systems	A	13	13	13	16
- Type		C,D,K	C,D,K	C,D,K	C,D,K
• Principal current (external protection) with ground water systems	A	13	13	13	16
- Type		C,D,K	C,D,K	C,D,K	C,D,K
• Control current (external protection)	A	13	13	13	13
- Type		B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z
Weight					
• Operating weight approx.	kg	155	160	165	170

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

[2] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

[5] < 10 °C: Crankcase heater is necessary

[6] Values for electrical data apply for supply voltage of 3~400 V

[7] Effective value

Thermalia® comfort H (7,10) with R134a

Type		H (7)	H (10)
Brine/water application B0W35			
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	179	188
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	134	140
Water/water application W10W35			
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	238	249
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	177	185
• Seasonal coefficient of performance moderate climate (brine) 35 °C/55 °C	SCOP	4.7/3.5	4.9/3.7
Max. performance data heating in acc. with EN 14511			
• Heat output B0W35	kW [3)]	6.5	9.1
• Coefficient of performance B0W35	COP	4.5	4.6
• Heat output W10W35	kW	9.1	12.8
• Coefficient of performance W10W35	COP	5.9	6.0
Nominal volume flow rate and pressure drop brine/water			
Heating (ΔT = 5 K)	m^3/h	1.1	1.6
• ΔP Pressure drop condenser	kPa	6.0	7.0
• Residual overpressure	kPa	70	55
Heat source (ΔT = 3 K)	m^3/h	1.5	2.1
• ΔP Pressure drop evaporator (glycol)	kPa	4.0	4.0
• Residual overpressure	kPa	76	91
Nominal volume flow rate and pressure drop water/water			
Heating (ΔT = 5 K)	m^3/h	1.6	2.3
• ΔP Pressure drop condenser	kPa	13	14
• Residual overpressure	kPa	49	33
Heat source (ΔT = 5 K) [4)]	m^3/h	1.3	1.9
• ΔP Pressure drop evaporator	kPa	4	4
• Residual overpressure	kPa	86	104
Operating limit values			
• Heating		see diagrams of areas of application	
• Hot water		see diagrams of areas of application	
• Operating pressure max. water side	bar	6	6
• Operating pressure max. brine side	bar	6	6
• Installation place operation [5)]	°C (min./max.)	5/35	5/35
• Storage	°C (min./max.)	-15/46	-15/46
• Compressor, type		1 x spiral (scroll), hermetic	
• Refrigerant filling quantity (R134a)	kg	2.8	3.2
- Type of compressor oil: EMKARATE RL 32-3MAF			
• Condenser/evaporator		Plate heat exchanger	
• Material		Stainless steel V4A, AISI 316, 1.4401	
• Pipe connections at rear	G	1″	1″

Type		H (7)	H (10)
Electrical data [6]			
• Voltage	V	3~400	3~400
• Frequency	Hz	50	50
• Voltage range	V	380-420	380-420
• Max. compressor operating current	A	6.8	10.1
• Starting current with starting current limiter [7]	A	13.6	20.2
• Principal current (external protection) with brine systems	A	13	13
- Type		C,D,K	C,D,K
• Principal current (external protection) with ground water systems	A	13	13
- Type		C,D,K	C,D,K
• Control current (external protection)	A	13	13
- Type		B,C,D,K,Z	B,C,D,K,Z
Weight			
• Operating weight approx.	kg	160	170

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

[2] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

[5] < 10 °C: Crankcase heater is necessary

[6] Values for electrical data apply for supply voltage of 3~400 V

[7] Effective value

Thermalia® comfort (8-17), comfort H (7,10)

Sound emission

The effective sound pressure level in the installation room depends on various factors such as room size, absorption capacity, reflection, free sound propagation, etc.

Therefore it is important that the installation room lies, if possible, outside the noise-sensitive range and is supplied with sound-absorbing doors.

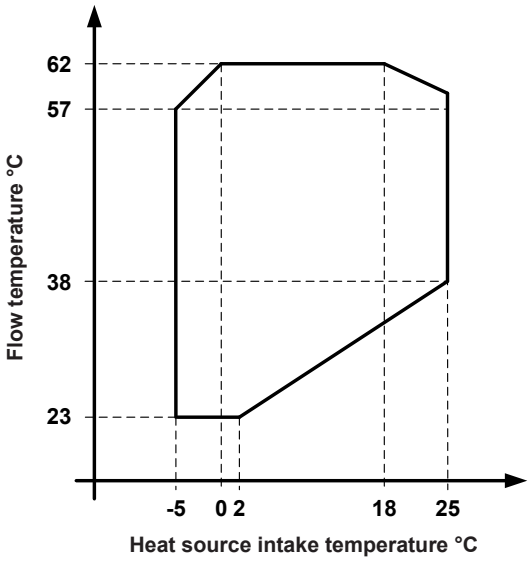
Ducts and pipes must be fixed to walls and ceiling in a way that no structure-borne sound is being transmitted to the system.

Thermalia® comfort (8-17) Thermalia® comfort H (7,10)	(8)	(10) (7)	(13)	(17) (10)
Sound power level dB(A)	44	45	45	46

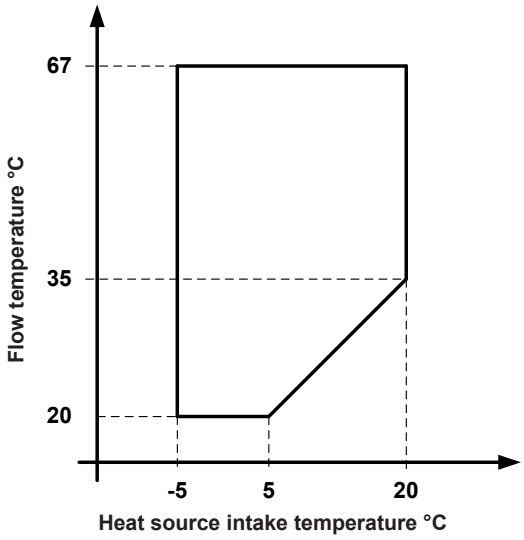
Diagrams of areas of application

Heating and hot water

Thermalia® comfort (8-17)



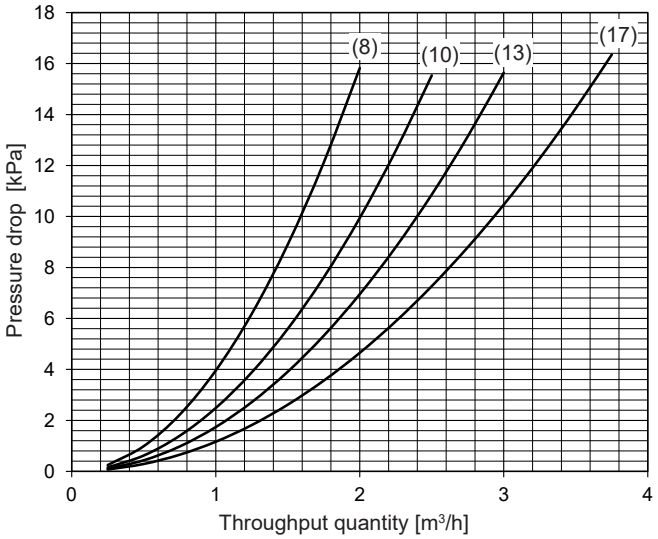
Thermalia® comfort H (7,10)



Thermalia® comfort (8-17)

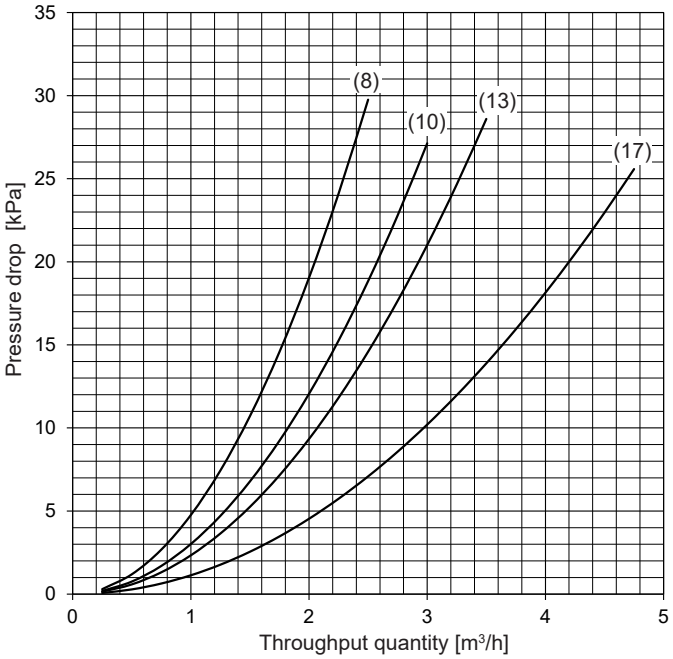
Heating

Pressure drop condenser with water



Heat source

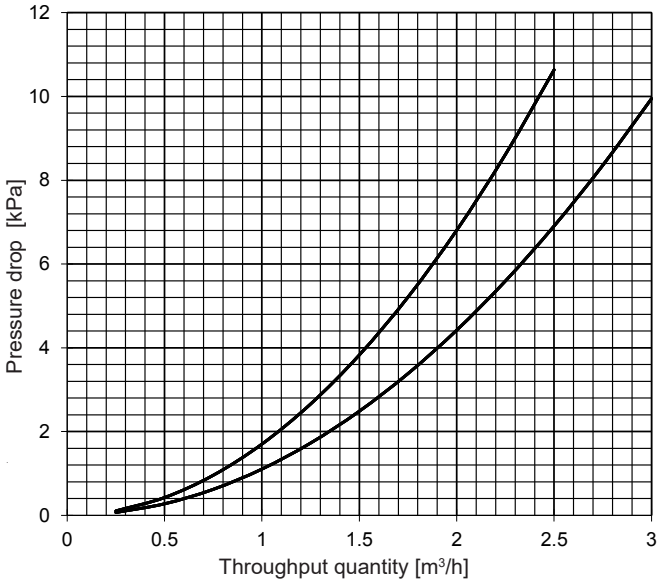
Pressure drop evaporator with ethylene glycol 25 % (Antifrogen N)



Thermalia® comfort H (7,10)

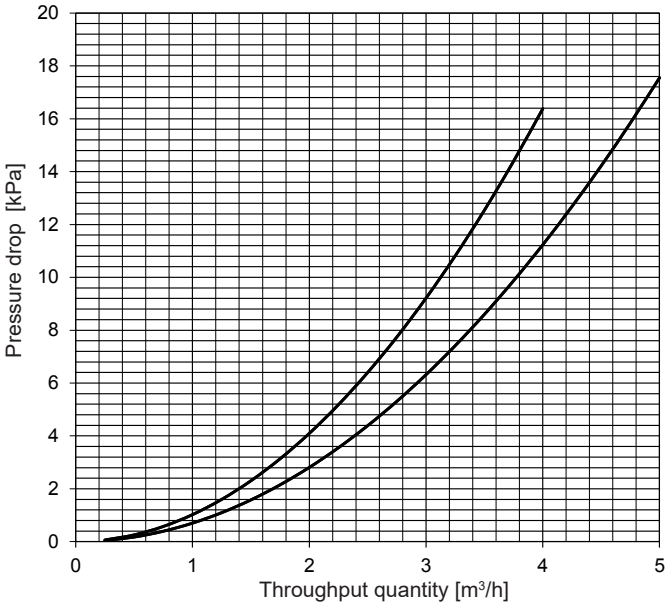
Heating

Pressure drop condenser with water



Heat source

Pressure drop evaporator with ethylene glycol 25 % (Antifrogen N)

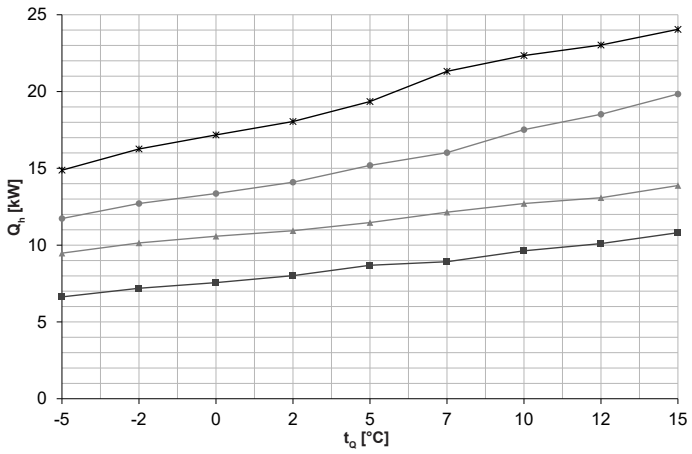


Performance data - heating

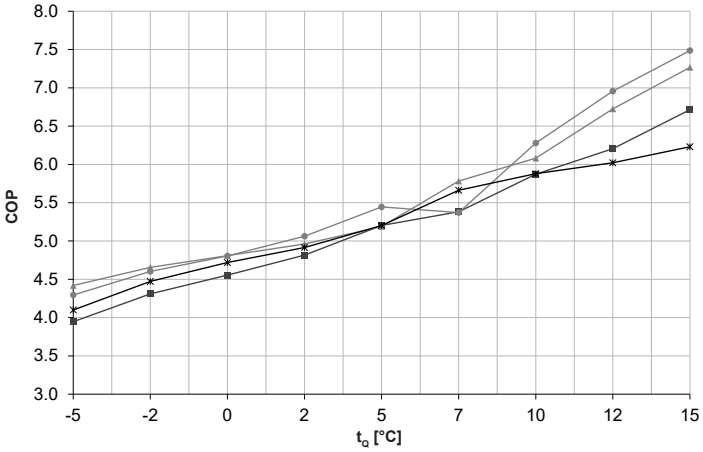
Maximum heat output

Thermalia® comfort (8-17)

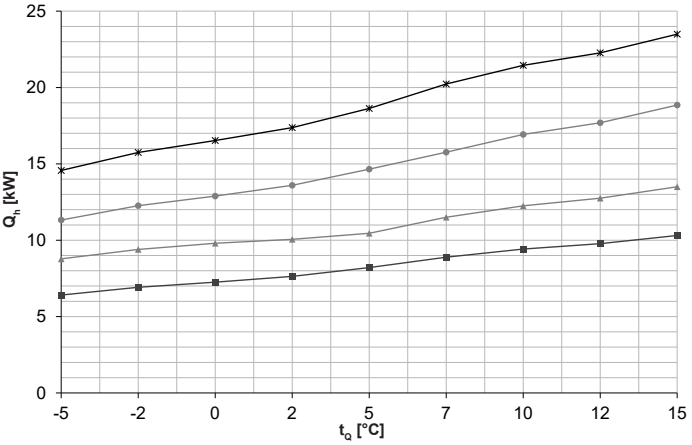
Heat output - t_{VL} 35 °C



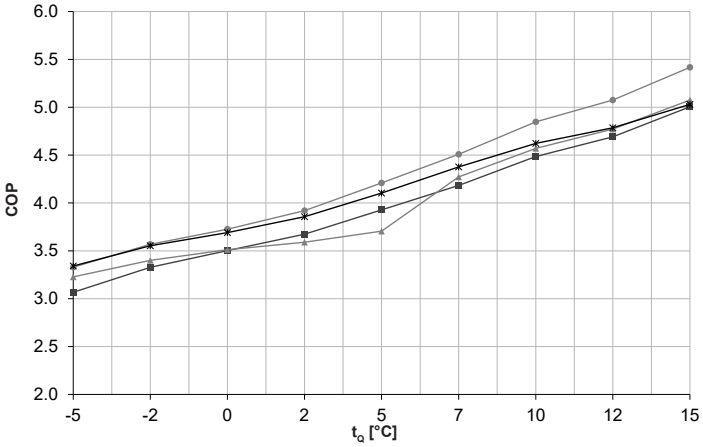
Coefficient of performance - t_{VL} 35 °C



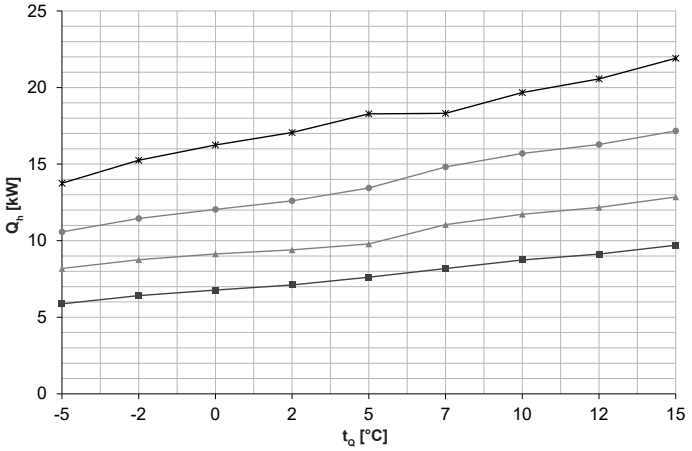
Heat output - t_{VL} 45 °C



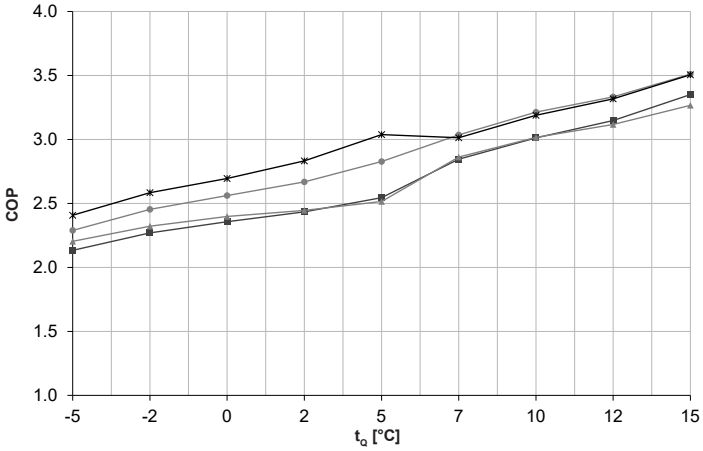
Coefficient of performance - t_{VL} 45 °C

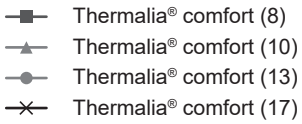


Heat output - t_{VL} 62 °C



Coefficient of performance - t_{VL} 62 °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

Performance data - heating
Thermalia® comfort (8-17)

Indications acc. to EN 14511

Type			(8)			(10)			(13)			(17)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP
		-5	6.7	1.5	4.3	9.7	2.0	5.0	11.9	2.5	4.7	15.0	3.4	4.4
		-2	7.3	1.5	4.8	10.4	2.0	5.2	12.9	2.5	5.1	16.4	3.4	4.9
	Brine	0	7.7	1.5	5.0	10.8	2.0	5.4	13.5	2.6	5.3	17.4	3.4	5.2
		2	8.1	1.5	5.3	11.2	2.0	5.6	14.3	2.6	5.6	18.3	3.4	5.4
30		5	8.9	1.5	5.8	11.8	2.0	5.9	15.4	2.6	6.0	19.6	3.4	5.7
		7	8.9	1.5	6.0	12.4	1.9	6.5	16.1	2.7	6.0	21.7	3.5	6.2
	Water	10	9.7	1.5	6.5	12.9	1.9	6.8	17.7	2.6	6.9	22.6	3.5	6.4
		12	10.2	1.5	6.9	13.2	1.7	7.8	18.8	2.4	7.9	23.3	3.5	6.6
		15	11.0	1.5	7.5	14.0	1.7	8.4	20.2	2.4	8.5	24.2	3.6	6.8
		-5	6.6	1.7	4.0	9.5	2.1	4.4	11.7	2.7	4.3	14.9	3.6	4.1
		-2	7.2	1.7	4.3	10.1	2.2	4.7	12.7	2.8	4.6	16.3	3.6	4.5
	Brine	0	7.6	1.7	4.6	10.6	2.2	4.8	13.4	2.8	4.8	17.2	3.6	4.7
		2	8.0	1.7	4.8	10.9	2.2	5.0	14.1	2.8	5.1	18.0	3.7	4.9
35		5	8.7	1.7	5.2	11.5	2.2	5.2	15.2	2.8	5.4	19.4	3.7	5.2
		7	8.9	1.7	5.4	12.1	2.1	5.8	16.0	3.0	5.4	21.3	3.8	5.7
	Water	10	9.6	1.6	5.9	12.7	2.1	6.1	17.5	2.8	6.3	22.3	3.8	5.9
		12	10.1	1.6	6.2	13.1	1.9	6.7	18.5	2.7	7.0	23.0	3.8	6.0
		15	10.8	1.6	6.7	13.9	1.9	7.3	19.8	2.7	7.5	24.1	3.9	6.2
		-5	6.5	1.9	3.5	9.1	2.4	3.8	11.5	3.1	3.8	14.7	4.0	3.7
		-2	7.1	1.9	3.8	9.8	2.5	4.0	12.5	3.1	4.0	16.0	4.0	4.0
	Brine	0	7.4	1.9	4.0	10.2	2.5	4.1	13.1	3.1	4.2	16.9	4.1	4.2
		2	7.8	1.9	4.2	10.5	2.5	4.2	13.8	3.1	4.4	17.7	4.1	4.3
40		5	8.5	1.9	4.5	11.0	2.5	4.4	14.9	3.1	4.8	19.0	4.1	4.6
		7	8.9	1.9	4.7	11.8	2.4	4.9	15.9	3.2	4.9	20.8	4.2	5.0
	Water	10	9.5	1.9	5.1	12.5	2.4	5.2	17.2	3.1	5.5	21.9	4.2	5.2
		12	9.9	1.9	5.4	12.9	2.3	5.6	18.1	3.1	5.9	22.6	4.2	5.3
		15	10.6	1.8	5.8	13.7	2.3	6.0	19.3	3.1	6.3	23.8	4.3	5.6
		-5	6.4	2.1	3.1	8.8	2.7	3.2	11.3	3.4	3.3	14.6	4.4	3.3
		-2	6.9	2.1	3.3	9.4	2.8	3.4	12.3	3.4	3.6	15.7	4.4	3.6
	Brine	0	7.3	2.1	3.5	9.8	2.8	3.5	12.9	3.5	3.7	16.5	4.5	3.7
		2	7.6	2.1	3.7	10.1	2.8	3.6	13.6	3.5	3.9	17.4	4.5	3.9
45		5	8.2	2.1	3.9	10.5	2.8	3.7	14.7	3.5	4.2	18.6	4.5	4.1
		7	8.9	2.1	4.2	11.5	2.7	4.3	15.8	3.5	4.5	20.2	4.6	4.4
	Water	10	9.4	2.1	4.5	12.3	2.7	4.6	16.9	3.5	4.9	21.5	4.6	4.6
		12	9.8	2.1	4.7	12.8	2.7	4.8	17.7	3.5	5.1	22.3	4.7	4.8
		15	10.3	2.1	5.0	13.5	2.7	5.1	18.9	3.5	5.4	23.5	4.7	5.0
		-5	6.2	2.3	2.7	8.6	3.0	2.9	11.1	3.8	3.0	14.3	4.8	3.0
		-2	6.7	2.3	2.9	9.2	3.1	3.0	12.0	3.8	3.2	15.6	4.9	3.2
	Brine	0	7.1	2.3	3.1	9.6	3.1	3.1	12.6	3.8	3.3	16.4	5.0	3.3
		2	7.4	2.3	3.2	9.9	3.1	3.2	13.3	3.8	3.5	17.3	5.0	3.5
50		5	8.0	2.3	3.4	10.3	3.1	3.3	14.3	3.9	3.7	18.6	5.0	3.7
		7	8.6	2.4	3.6	11.4	3.0	3.7	15.5	3.9	4.0	19.6	5.1	3.8
	Water	10	9.2	2.4	3.9	12.1	3.0	4.0	16.6	3.9	4.3	20.9	5.1	4.1
		12	9.5	2.4	4.1	12.6	3.0	4.2	17.3	3.9	4.4	21.7	5.2	4.2
		15	10.1	2.3	4.3	13.3	3.0	4.4	18.4	3.9	4.7	23.0	5.2	4.4
		-5	5.9	2.5	2.4	8.4	3.3	2.6	10.9	4.1	2.6	14.0	5.3	2.7
		-2	6.5	2.5	2.6	9.0	3.4	2.7	11.8	4.2	2.8	15.4	5.4	2.9
	Brine	0	6.9	2.5	2.7	9.4	3.4	2.8	12.4	4.2	3.0	16.3	5.4	3.0
		2	7.2	2.6	2.8	9.7	3.4	2.8	13.0	4.2	3.1	17.2	5.5	3.2
55		5	7.8	2.6	3.0	10.1	3.5	2.9	13.9	4.2	3.3	18.5	5.5	3.4
		7	8.4	2.6	3.2	11.2	3.4	3.3	15.2	4.3	3.5	19.0	5.6	3.4
	Water	10	8.9	2.6	3.4	11.9	3.4	3.5	16.2	4.3	3.8	20.3	5.7	3.6
		12	9.3	2.6	3.5	12.4	3.4	3.7	16.9	4.3	3.9	21.1	5.7	3.7
		15	9.9	2.6	3.8	13.1	3.4	3.9	17.9	4.3	4.1	22.4	5.7	3.9
		-5	5.9	2.8	2.1	8.2	3.7	2.2	10.6	4.6	2.3	13.8	5.7	2.4
		-2	6.4	2.8	2.3	8.8	3.8	2.3	11.5	4.7	2.5	15.3	5.9	2.6
	Brine	0	6.8	2.9	2.4	9.1	3.8	2.4	12.0	4.7	2.6	16.3	6.0	2.7
		2	7.1	2.9	2.4	9.4	3.8	2.5	12.6	4.7	2.7	17.1	6.0	2.8
62		5	7.6	3.0	2.5	9.8	3.9	2.5	13.4	4.8	2.8	18.3	6.0	3.0
		7	8.2	2.9	2.9	11.0	3.9	2.9	14.8	4.9	3.0	18.3	6.1	3.0
	Water	10	8.7	2.9	3.0	11.7	3.9	3.0	15.7	4.9	3.2	19.7	6.2	3.2
		12	9.1	2.9	3.2	12.2	3.9	3.1	16.3	4.9	3.3	20.6	6.2	3.3
		15	9.7	2.9	3.4	12.9	3.9	3.3	17.2	4.9	3.5	21.9	6.2	3.5

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

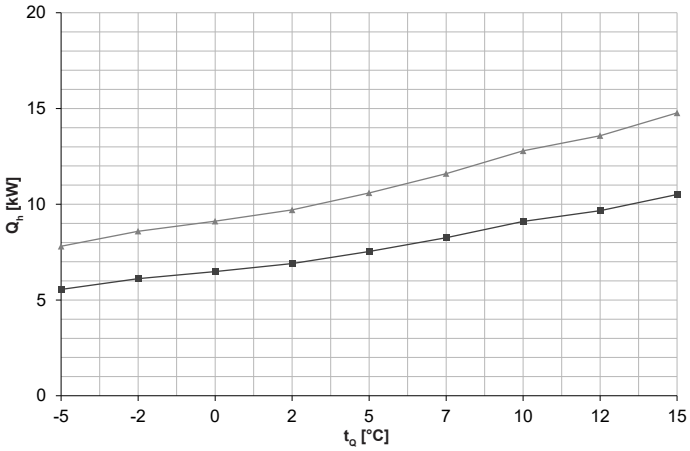
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - heating

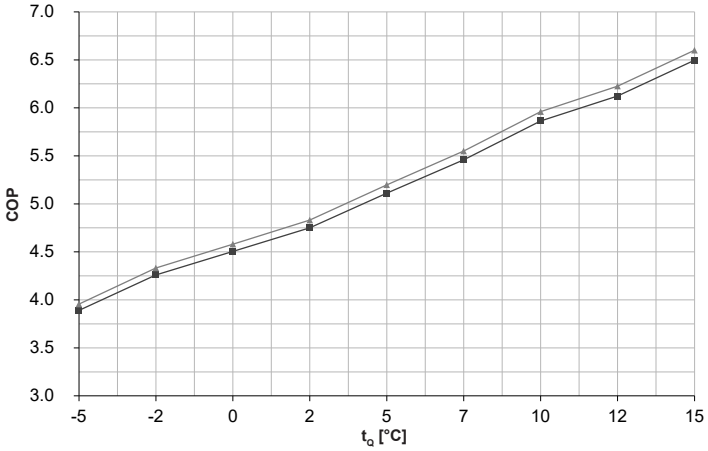
Maximum heat output

Thermalia® comfort H (7,10)

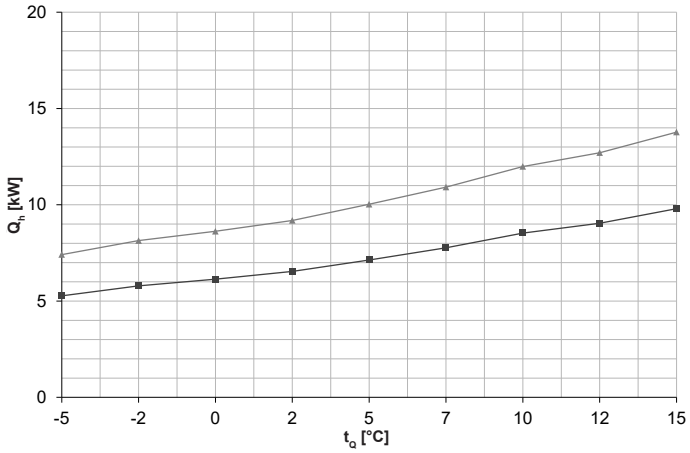
Heat output - t_{VL} 35 °C



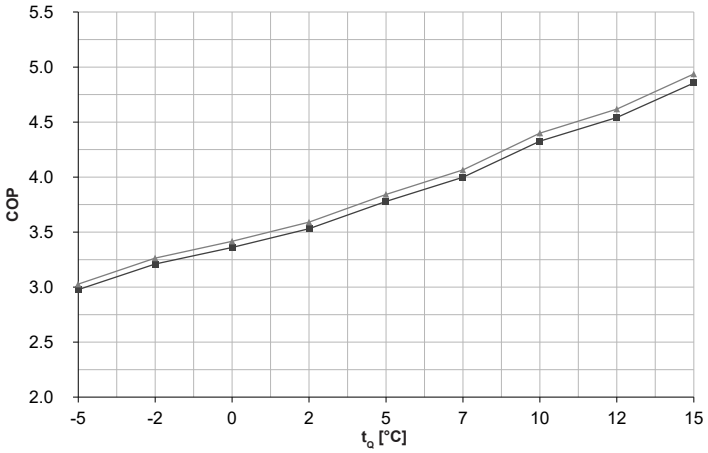
Coefficient of performance - t_{VL} 35 °C



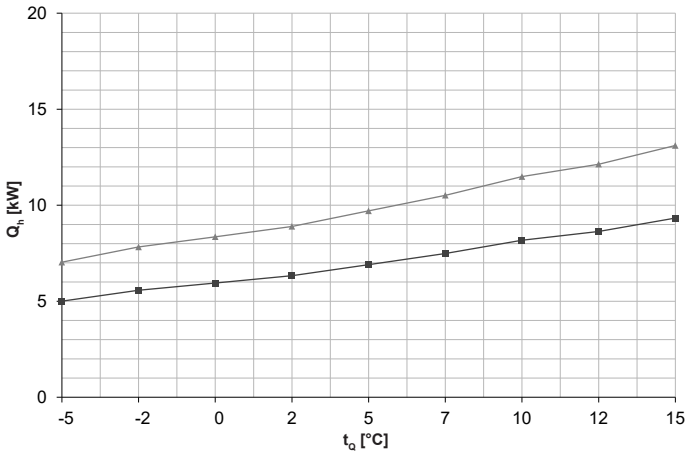
Heat output - t_{VL} 50 °C



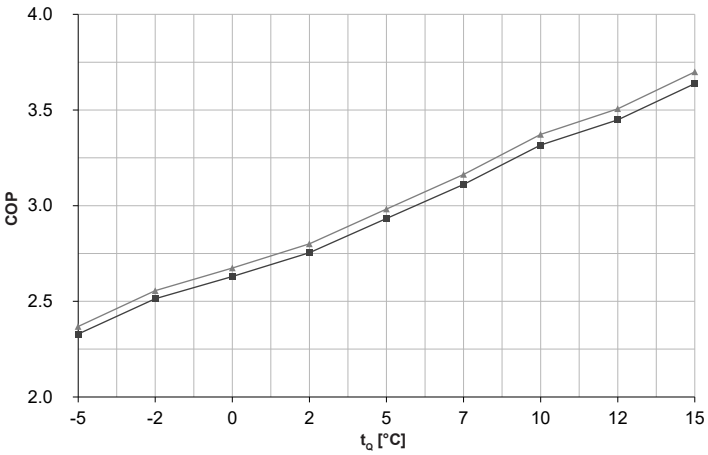
Coefficient of performance - t_{VL} 50 °C



Heat output - t_{VL} 65 °C



Coefficient of performance - t_{VL} 65 °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

Thermalia® comfort H (7)
Thermalia® comfort H (10)

Performance data - heating
Thermalia® comfort H (7,10)

Indications acc. to EN 14511

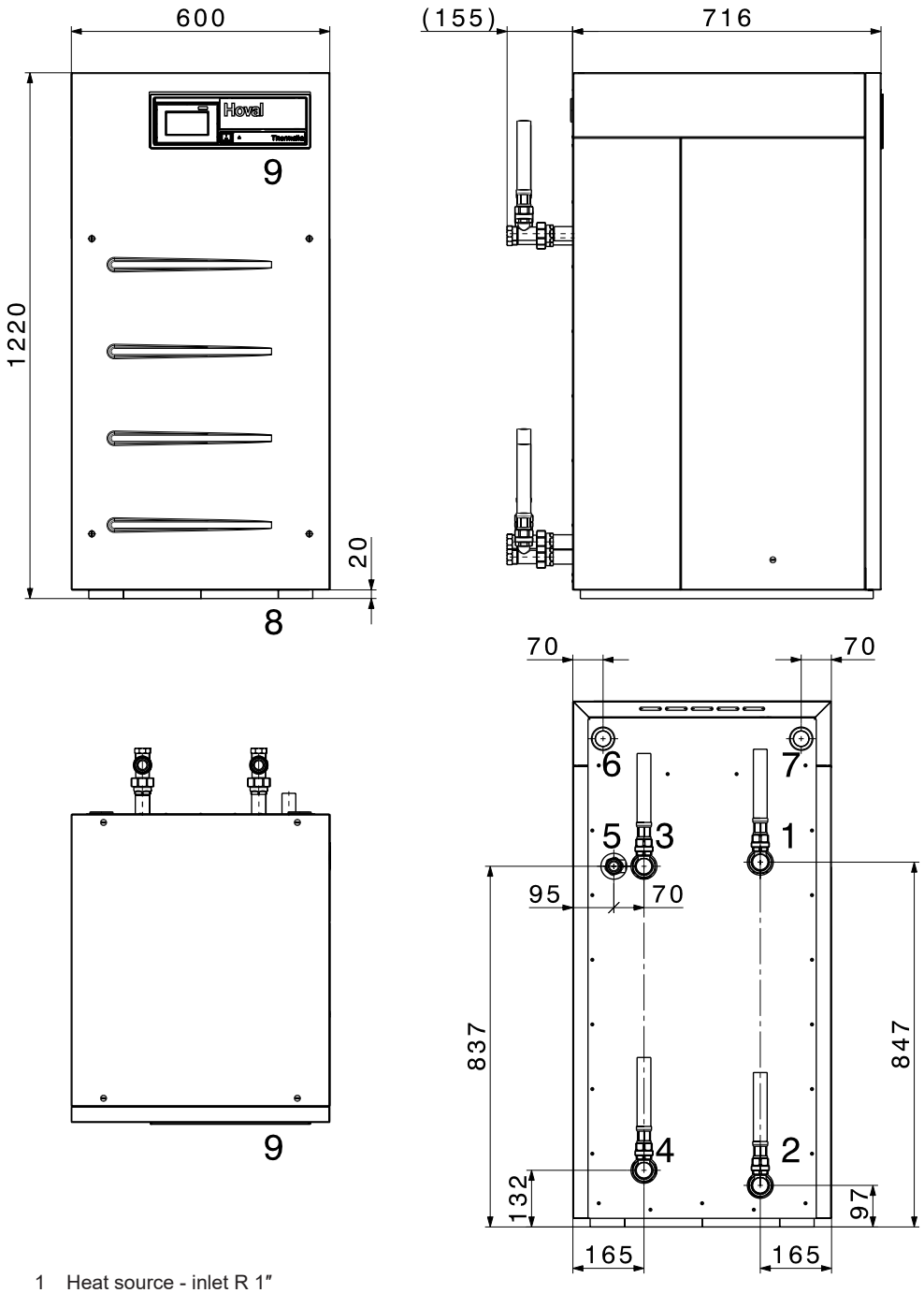
Type			H (7)			H (10)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP
30	Brine	-5	5.6	1.4	4.2	7.9	1.9	4.2
		-2	6.2	1.4	4.6	8.7	1.9	4.7
		0	6.6	1.4	4.9	9.2	1.9	4.9
		2	7.0	1.4	5.1	9.8	1.9	5.2
		5	7.6	1.4	5.5	10.7	1.9	5.6
	Water	7	8.4	1.4	5.9	11.8	2.0	6.0
		10	9.3	1.5	6.3	13.0	2.0	6.4
		12	9.8	1.5	6.6	13.8	2.1	6.7
		15	-	-	-	-	-	-
35	Brine	-5	5.6	1.4	3.9	7.8	2.0	4.0
		-2	6.1	1.4	4.3	8.6	2.0	4.3
		0	6.5	1.4	4.5	9.1	2.0	4.6
		2	6.9	1.5	4.8	9.7	2.0	4.8
		5	7.5	1.5	5.1	10.6	2.0	5.2
	Water	7	8.3	1.5	5.5	11.6	2.1	5.6
		10	9.1	1.6	5.9	12.8	2.1	6.0
		12	9.7	1.6	6.1	13.6	2.2	6.2
		15	10.5	1.6	6.5	14.8	2.2	6.6
40	Brine	-5	5.5	1.5	3.5	7.7	2.1	3.6
		-2	6.0	1.6	3.9	8.4	2.2	3.9
		0	6.3	1.6	4.1	8.9	2.2	4.1
		2	6.8	1.6	4.3	9.5	2.2	4.3
		5	7.4	1.6	4.6	10.4	2.2	4.7
	Water	7	8.1	1.7	4.9	11.3	2.3	4.9
		10	8.9	1.7	5.3	12.5	2.3	5.4
		12	9.4	1.7	5.5	13.2	2.4	5.6
		15	10.2	1.7	5.9	14.4	2.4	6.0
45	Brine	-5	5.4	1.7	3.2	7.5	2.3	3.4
		-2	5.9	1.7	3.5	8.2	2.3	3.6
		0	6.2	1.7	3.7	8.7	2.3	3.7
		2	6.6	1.7	3.9	9.3	2.4	3.9
		5	7.2	1.7	4.1	10.1	2.4	4.2
	Water	7	7.9	1.8	4.4	11.1	2.5	4.4
		10	8.7	1.8	4.8	12.2	2.5	4.8
		12	9.2	1.8	5.0	12.9	2.5	5.1
		15	10.0	1.9	5.4	14.0	2.6	5.5
50	Brine	-5	5.3	1.8	3.0	7.4	2.4	3.0
		-2	5.8	1.8	3.2	8.1	2.5	3.3
		0	6.1	1.8	3.4	8.6	2.5	3.4
		2	6.5	1.9	3.5	9.2	2.6	3.6
		5	7.1	1.9	3.8	10.0	2.6	3.8
	Water	7	7.8	1.9	4.0	10.9	2.7	4.1
		10	8.5	2.0	4.3	12.0	2.7	4.4
		12	9.0	2.0	4.5	12.7	2.8	4.6
		15	9.8	2.0	4.9	13.8	2.8	4.9
55	Brine	-5	5.2	1.9	2.8	7.3	2.6	2.8
		-2	5.7	1.9	3.0	8.0	2.7	3.0
		0	6.1	2.0	3.1	8.5	2.7	3.2
		2	6.5	2.0	3.3	9.1	2.7	3.3
		5	7.1	2.0	3.5	9.9	2.8	3.5
	Water	7	7.7	2.1	3.7	10.8	2.9	3.8
		10	8.4	2.1	4.0	11.8	2.9	4.0
		12	8.9	2.1	4.2	12.5	3.0	4.2
		15	9.6	2.2	4.4	13.5	3.0	4.5
62	Brine	-5	5.1	2.1	2.4	7.1	2.9	2.5
		-2	5.6	2.1	2.6	7.9	2.9	2.7
		0	6.0	2.2	2.8	8.4	3.0	2.8
		2	6.4	2.2	2.9	9.0	3.0	2.9
		5	7.0	2.3	3.1	9.8	3.1	3.1
	Water	7	7.5	2.3	3.3	10.6	3.2	3.3
		10	8.2	2.4	3.5	11.6	3.3	3.6
		12	8.7	2.4	3.6	12.2	3.3	3.7
		15	9.4	2.4	3.9	13.2	3.4	3.9
65	Brine	-5	5.0	2.1	2.3	7.0	3.0	2.4
		-2	5.6	2.2	2.5	7.8	3.1	2.6
		0	5.9	2.3	2.6	8.4	3.1	2.7
		2	6.3	2.3	2.8	8.9	3.2	2.8
		5	6.9	2.4	2.9	9.7	3.3	3.0
	Water	7	7.5	2.4	3.1	10.5	3.3	3.2
		10	8.2	2.5	3.3	11.5	3.4	3.4
		12	8.6	2.5	3.5	12.1	3.5	3.5
		15	9.3	2.6	3.6	13.1	3.5	3.7
		25	-	-	-	-	-	-

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 of the 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”

Thermalia® comfort (8-17) and comfort H (7,10)

(Dimensions in mm)



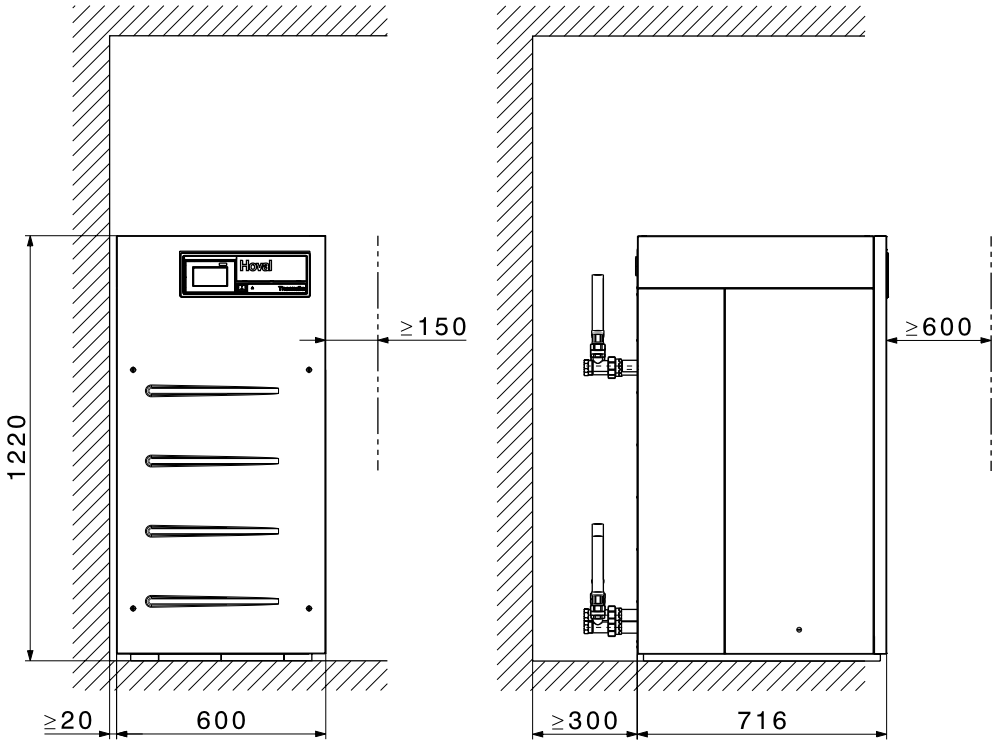
1 Heat source - inlet R 1″
2 Heat source - outlet R 1″
3 Heating flow R 1″
4 Heating return R 1″
5 Hot water R 1″
6 Cable feedthrough for main current
7 Cable feedthrough for sensors
8 Vibration damping
9 Control panel

The 4 flexible hoses 1″ can be extracted from the heat pump by at least 300 mm.

Required space

Required wall distance in mm for operation and maintenance
(Dimensions in mm)

front	rear	right or left side
min. 600	min. 300	min. 150



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

Hoval Thermalia® twin
Hoval Thermalia® twin H

Brine/water-water/water heat pump

- Brine/water-water/water heat pump with two output stages for indoor installation
- Compact unit with high energy efficiency
- Extremely low-noise with triple-mounted construction
- Stable framework of galvanised sheet steel; with removable, powder-coated, sound-insulated side panels, colour brown red (RAL 3011)
- Sound-insulated plastic hood, colour flame red (RAL 3000)
- Temperatures and pressures of brine and refrigeration circuit available
- 2 spiral (scroll) compressors
- Electronic expansion valve
- Plate heat exchanger system of stainless steel
- Electronic starting current limiter with rotary field/phase monitoring for each compressor
- Integrated brine pressure monitoring
- Hydraulic connections to the rear
- Sound-insulating floor mat
- Refrigerant
  Thermalia® twin (20-42) with R410A
  Thermalia® twin H (13-22) with R134a
- Heat pump wired ready
- TopTronic® E controller installed

Electrical connections
- Connection to the rear

TopTronic® E controller

Control panel
- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

TopTronic® E control module
- Simple, intuitive operating concept
- Display of the most important operating statuses
- 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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

Model range

Thermalia® twin type	Water/water 35 °C	Water/water 55 °C	Brine/water 35 °C	Brine/water 55 °C	Refrigerant	Max. flow °C	Heat output B0W35 kW	Heat output W10W35 kW
(20)	A+++	A+++	A+++	A++	R410A	62	20.4	27.3
(26)	A+++	A+++	A+++	A++	R410A	62	26.2	35.1
(36)	A+++	A+++	A+++	A+++	R410A	62	35.3	46.4
(42)	A+++	A+++	A+++	A++	R410A	62	42.0	55.4
H (13)	A+++	A+++	A+++	A++	R134a	67	12.3	17.0
H (19)	A+++	A+++	A+++	A++	R134a	67	18.0	24.7
H (22)	A+++	A+++	A+++	A++	R134a	67	20.9	28.8

Energy efficiency class of the compound system with control

TopTronic® E basic module heat generator TTE-WEZ
- Control functions integrated 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 heat balancing or
  - module expansion Universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

Number of modules that can be additionally 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.

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
- Heat pump on pallet, plastic hood and floor plate separately packed
- Flexible hoses included
- Sensor set separately packed

Brine/water-water/water heat pump

Hoval Thermalia® twin

Refrigerant R410A

Flow temperature max. 62 °C

Thermalia® twin type	Heat output B0W35 kW	W10W35 kW	Part No.
(20)	20.4	27.3	7018 990
(26)	26.2	35.1	7018 991
(36)	35.3	46.4	7018 992
(42)	42.0	55.4	7018 993

Hoval Thermalia® twin H

Refrigerant R410A

Flow temperature max. 67 °C

Thermalia® twin H type	Heat output B0W35 kW	W10W35 kW	Part No.
(13)	12.3	17.0	7018 994
(19)	18.0	24.7	7018 995
(22)	20.9	28.8	7018 996

Notice
Suitable heat source and charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0-10 V or PWM1

Premium pump Stratos
with IF module Stratos Ext. Off (0-10 V)

See “Circulating pumps”

Electric heating elements
see “Calorifiers” - chapter “Electric heating elements”

Energy efficiency class
see Description

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

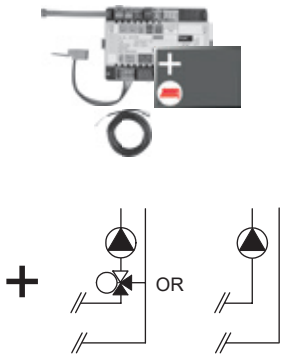
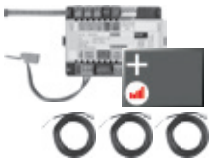
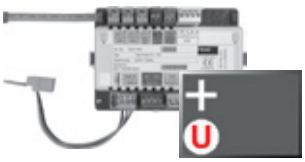
Further information
see “Description”

Hose set SPCH40-40-10-4 — 6058 823
for Thermalia® twin (20,26) and Thermalia® twin H (13,19)
Consisting of:
- 4 reinforced hoses PN 10 DN 40 1½″ IT insulated for brine and heating side flat-sealing with union nut
- Length: 1.0 m
- 4 brackets DN 40
- Seals

Hose set SPCH50-50-10-4 — 6058 824
for Thermalia® twin (36,42) and Thermalia® twin H (22)
Consisting of:
- 4 reinforced hoses PN 10 DN 50 2″ IT insulated for brine and heating side flat-sealing with union nut
- Length: 1.0 m
- 4 brackets DN 50
- Seals

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
	**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!	6034 576
	**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** Suitable flow rate sensors (pulse sensors) must be provided on site.	6037 062
	**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	6034 575

Flow rate sensor sets

Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
DN 8	G ¾″	0.9-15	6038 526
DN 10	G ¾″	1.8-32	6038 507
DN 15	G 1″	3.5-50	6038 508
DN 20	G 1¼″	5-85	6038 509
DN 25	G 1½″	9-150	6038 510

Brass housing

Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950
DN 40	G 2 ″	22-400	6055 092

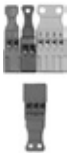
Hoval recommended use
Flow rate sensor set DN 40 made of brass. Installation location within the heat pump.

Notice
The flow rate sensor set must be installed without fail. Freezing can be prevented with the help of flow rate sensors and further technical measures. In order to protect the heat pump from frost in the event of a power failure or for example in bivalence mode, a system separation or other technical measures must be provided on site.

Accessories for TopTronic® E

TopTronic® E controller modules

		Part No.
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

	Part No.
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

		Part No.
TTE-RBM	TopTronic® E room control modules	
	easy white	6037 071
	comfort white	6037 069
	comfort black	6037 070

Enhanced language package TopTronic® E 6039 253

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

HovalConnect

	Part No.
HovalConnect LAN	6049 496
HovalConnect WLAN	6049 498
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E interface modules

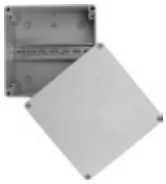
	Part No.
GLT module 0-10 V	6034 578

TopTronic® E sensors

		Part No.
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

	Part No.
for various release or switching functions	
Bivalent switch 1-piece	2056 858
Bivalent switch 2-piece	2061 826



System housing

	Part No.
System housing 182 mm	6038 551
System housing 254 mm	6038 552

TopTronic® E wall casing

		Part No.
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”

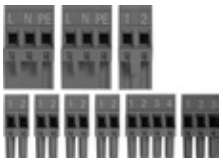
Accessories

Switching ball valve VBI60...L
DN 25-50, PN 16, 120 °C

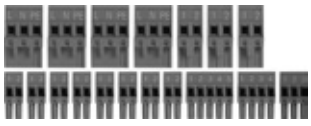
- Three-way ball valve made of brass with threaded connection
- Leakage rate: 0 ... 0.0001 % of kvs value
- Permitted media: cold water, cooling water, DHW, hot water, water with frost protection
- Recommendation: water treatment according to VDI 2035
- Media temperature: -10 ... 120 °C

DN	Connection inches	kvs m³/h	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Motor drive GLB341.9E — 2070 331
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



Expansion connector set — 6032 509
for the automatic heat pump device ECR461
Use for additional function:
- Flow monitor
- Crankcase bottom heating
(included in the scope of delivery for Belaria® twin A, twin AR, dual AR)
- Condensation drain heating
- Heat quantity metering
Plugs:
- 1 230 V digital input
- 2 230 V outputs
- 4 low-voltage inputs
- 1 ratio. Input
- 1 4-pin low-voltage input



Universal plug set — 6032 510
for automatic heat pump device ECR461
Plugs:
- 3 digital 230 V inputs
- 4 230 V outputs
- 6 low-voltage inputs
- 2 low-voltage outputs
- 1 ratio. input
- 1 electronic expansion valve
- 1 4-pin low-voltage input

	Part No.
Necessary at boiler room temperatures < 10 °C	
 **Crankcase heater** for Belaria® twin I/IR (20-30), Thermalia® comfort (8-17), Thermalia® comfort H (7,10), Thermalia® twin (20-42), Thermalia® twin H (13-22) Necessary for heating room temperatures < 10 °C for protecting the compressor For Belaria® twin I/IR 2 pieces are necessary	6019 718
 **Instantaneous water heater kit DN 50** consisting of electrical box ready for connection for electrical protection incl. assembly fittings. for combination with all screw-in electric heating elements EP. Screw-in electric heating element must be ordered separately.	6044 070
 **System water protection filter** **FGM025...050 - 200** For horizontal installation in return for filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure drop. Consisting of: - Filter head and bowl in brass - Magnetic insert (nickel-neodymium) - 2 pressure gauges - Very large filter surface made of stainless steel - Filter fineness 200 µm - With drain valve - Connections Rp 1″ and Rp 2″: Internal thread with integrated shut-off valves and union connection (outlet) - Water temperature: max. 90 °C - incl. steam diffusion-tight insulating shells	
Notice Fulfills the function of sludge separator and strainer	
 **FF050 - 200** 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 insert (nickel-neodymium) - 2 pressure gauges - Very large filter surface in stainless steel - Filter fineness 200 µm - With filling and drain valve - Connections flange DN 50	

Type	Connection	Flow rate at Δp < 0.1 bar pressure drop m³/h	
FGM025	Rp 1″	5.5	6058 256
FGM025	Rp 2″	7.2	6058 257
FF050	DN 50	18.0	2076 376

Further strainers
see “Various system components”

Accessories

Vibration decoupler
for reducing structure-borne noise
from heat pumps in the indoor area
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	Part No.
DN 25	1″	300	2082 222
DN 25	1″	500	2082 223
DN 25	1″	1000	2080 794
DN 32	1¼″	300	2082 224
DN 32	1¼″	500	2082 225
DN 32	1¼″	1000	2080 796
DN 40	1½″	500	2082 226
DN 40	1½″	1000	2080 798
DN 50	2″	500	2082 227
DN 50	2″	1000	2080 800

Accessories water/water

Safety group SG15-¾″ 2015 354
Retaining bar incl. safety valve,
pressure gauge, air vent and connection
fittings for expansion chambers

Diaphragm pressure expansion tank N 25/4 2078 741
for closed heating and cooling
water systems according to DIN EN 13831
Certification according to Pressure
Equipment Directive 2014/68/EU

- Durable epoxy resin coating
- Non-exchangeable half-diaphragm
according to DIN EN 13831
- Addition of antifreeze
min. 25 % to 50 %
- With threaded connections
System temperature max. 120 °C
Operating temperature: max. 70 °C
Colour: grey
Nominal volume: 25 l
Operating pressure: max. 4 bar
Ex-works gas inlet pressure: 1.5 bar
Connection: R ¾″
Diameter: 308 mm
Height: 477 mm
Weight: 4.3 kg

Ground water accessories

		Part No.
	**Brine filling station in compact design DN 25** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 25 G 1″ Kvs: 12.5 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6037 537
	**Brine filling station in compact design DN 32** with shut-off valves, filter and EPS insulation. Application temperatures: -20 °C to +60 °C Frost protection: max. 50 % Connections: DN 32 G 1¼″ Kvs: 22 m³/h Max. operating pressure: 1.0 MPa (10 bar) Dirt screen integrated	6033 364
	**Float body flow meter** Bistable Reed contact as NC contact Area of application 1500-15000 l/h Temperature range 0-80 °C Nominal pressure: 10 bar Connection: Rp 2″ Pressure drop: 30 mbar Installation length: 335 mm Max. voltage: 230 V Max. continuous current: 0.2 A	2040 709
	**Ground water pump kit SB-GWP** for Thermalia® twin (20-42), twin H (13-22) Contactor for actuation of a 3-phase ground water pump. Ready to connect without thermal overload protection	6041 092

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.

Thermalia® twin (20-42) with R410A

Type		(20)	(26)	(36)	(42)
Brine/water application B0W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	A+++/A+++	A+++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	202	198	206	203
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	138	138	148	135
Water/water application W10W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	277	274	270	259
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	183	180	191	176
• Seasonal coefficient of performance moderate climate (brine) 35 °C /55 °C	SCOP	5.2/3.6	5.2/3.6	5.4/3.9	5.3/3.6
Max. performance data heating in acc. with EN 14511					
• Heat output B0W35	kW [3)]	20.4	26.2	35.3	42.0
• Coefficient of performance B0W35	COP	4.9	4.8	5.0	4.8
• Heat output W10W35	kW	27.3	35.1	46.4	55.4
• Coefficient of performance W10W35	COP	6.6	6.4	6.4	6.1
Nominal volume flow rate and resistance brine/water heat pump					
Heating (Δt = 7 K)	m^3/h	2.5	3.3	4.4	5.2
• ΔP Pressure drop condenser	kPa	5.3	7.3	5	5.3
Heat source (Δt = 3 K)	m^3/h	4.9	6.2	8.5	10.0
• ΔP Pressure drop evaporator	kPa	12	13	14	14
Nominal volume flow rate and resistance water/water heat pump					
Heating (Δt = 7 K)	m^3/h	3.4	4.3	5.7	6.8
• ΔP Pressure drop condenser	kPa	9.8	12.5	8.5	9.0
Heat source (Δt = 5 K) [4)]	m^3/h	4.0	5.0	6.8	8.0
• ΔP Pressure drop evaporator	kPa	5.0	5.5	6.5	6.0
Operating limit values		see diagrams of areas of application			
• Operating pressure max. water side	bar	6	6	6	6
• Operating pressure max. brine side	bar	6	6	6	6
• Installation place operation [5)]	°C (min./max.)	5/35	5/35	5/35	5/35
• Storage	°C (min./max.)	-15/50	-15/50	-15/50	-15/50
• Compressor, type		2 x spiral (scroll), hermetic			
• Refrigerant filling quantity (R410A)	kg	6.5	7.1	8.2	9.0
- Type of compressor oil: EMKARATE RL 32-3MAF					
• Condenser/evaporator		Plate heat exchanger			
• Material		Stainless steel V4A, AISI 316, 1.4401			
• Connections	R	1½″	1½″	2″	2″
• Piping connections with flex. connecting hose	Rp	1½″	1½″	2″	2″
Electrical data [6)]					
• Voltage	V	3~400	3~400	3~400	3~400
• Frequency	Hz	50	50	50	50
• Voltage range	V	380-420	380-420	380-420	380-420
• Max. compressor operating current	A	13.1	16.9	24.0	29.3
• Starting current with starting current limiter [7)]	A	25.4	32.7	44.5	55.1
• Principal current (external protection) with brine systems	A	16	20	32	32
- Type		C,D,K	C,D,K	C,D,K	C,D,K
• Principal current (external protection) with ground water systems	A	20	25	32	40
- Type		C,D,K	C,D,K	C,D,K	C,D,K
• Control current (external protection)	A	13	13	13	13
- Type		B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z
Weight					
• Operating weight approx.	kg	280	286	298	310

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4)] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

[5)] < 10 °C: Crankcase heater is necessary

[6)] Values for electrical data apply for supply voltage of 3~400 V

[7)] Effective value, operating current compressor 1 + starting current with starting current limiter

Thermalia® twin H (13-22) with R134a

Type		H (13)	H (19)	H (22)
Brine/water application B0W35				
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	A+++/A++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	181	175	183
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	127	132	133
Water/water application W10W35				
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++	A+++/A+++
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	225	226	239
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	170	172	178
• Seasonal coefficient of performance moderate climate (brine) 35 °C /55 °C	SCOP	4.7/3.4	4.6/3.5	4.9/3.5
Max. performance data heating in acc. with EN 14511				
• Heat output B0W35	kW [3)]	12.3	18.0	20.9
• Coefficient of performance B0W35	COP	4.5	4.4	4.6
• Heat output W10W35	kW	17.0	24.7	28.8
• Coefficient of performance W10W35	COP	5.7	5.6	5.9
Nominal volume flow rate and resistance brine/water heat pump				
Heating (Δt = 7 K)	m^3/h	1.6	2.3	2.7
• ΔP Pressure drop condenser	kPa	1.6	2.0	2.3
Heat source (Δt = 3 K)	m^3/h	2.9	4.2	4.9
• ΔP Pressure drop evaporator	kPa	4	5	6
Nominal volume flow rate and resistance water/water heat pump				
Heating (Δt = 7 K)	m^3/h	2.2	3.2	3.8
• ΔP Pressure drop condenser	kPa	3.1	3.9	4.4
Heat source (Δt = 5 K) [4)]	m^3/h	2.6	3.7	4.4
• ΔP Pressure drop evaporator	kPa	2.4	3.0	3.6
Operating limit values		see diagrams of areas of application		
• Operating pressure max. water side	bar	6	6	6
• Operating pressure max. brine side	bar	6	6	6
• Installation place operation [5)]	°C (min./max.)	5/35	5/35	5/35
• Storage	°C (min./max.)	-15/50	-15/50	-15/50
• Compressor, type		2 x spiral (scroll), hermetic		
• Refrigerant filling quantity (R134a)	kg	4.8	5.9	6.5
- Type of compressor oil: EMKARATE RL 32-3MAF				
• Condenser/evaporator		Plate heat exchanger		
• Material		Stainless steel V4A, AISI 316, 1.4401		
• Connections	R	2″	2″	2″
• Piping connections with flex. connecting hose	Rp	2″	2″	2″
Electrical data [6)]				
• Voltage	V	3~400	3~400	3~400
• Frequency	Hz	50	50	50
• Voltage range	V	380-420	380-420	380-420
• Max. compressor operating current	A	9.4	13.3	15.8
• Starting current with starting current limiter [7)]	A	21.7	27.1	37.4
• Principal current (external protection) with brine systems	A	16	16	20
- Type		C,D,K	C,D,K	C,D,K
• Principal current (external protection) with ground water systems	A	16	20	25
- Type		C,D,K	C,D,K	C,D,K
• Control current (external protection)	A	13	13	13
- Type		B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z
Weight				
• Operating weight approx.	kg	273	283	293

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4)] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

[5)] < 10 °C: Crankcase heater is necessary

[6)] Values for electrical data apply for supply voltage of 3~400 V

[7)] Effective value, operating current compressor 1 + starting current with starting current limiter

Thermalia® twin (20-42), twin H (13-22)

Sound emission

The effective sound pressure level [1] in the installation room depends on various factors such as room size, absorption capacity, reflection, free sound propagation, etc.

Therefore it is important that the installation room lies, if possible, outside the noise-sensitive range and is supplied with sound-absorbing doors.

Ducts and pipes must be fixed to walls and ceiling in a way that no structure-borne sound is being transmitted to the system.

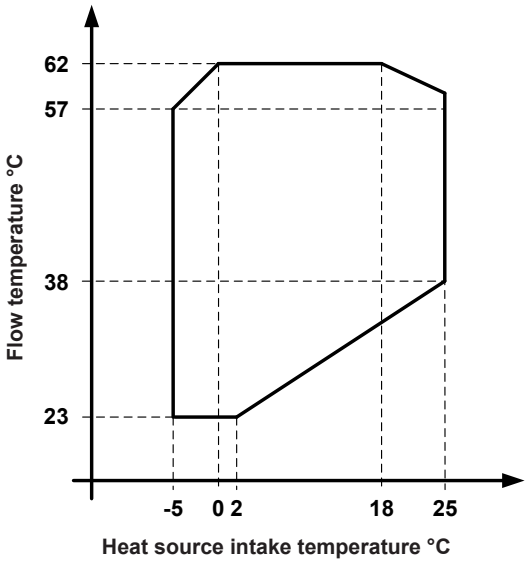
Thermalia® twin (20-42)		(20)		(26)		(36)		(42)	
Thermalia® twin H (13-22)		(13)		(19)		(22)			
Stage		1	2	1	2	1	2	1	2
Sound power level dB(A)	dB(A)	47	50	49	51	52	55	53	56
Sound pressure level dB(A) [1]	dB(A)	35	38	37	39	40	43	41	44

[1] Sound pressure level, distance 1 m (in standard room with approx. 5-6 dB(A) sound absorption)

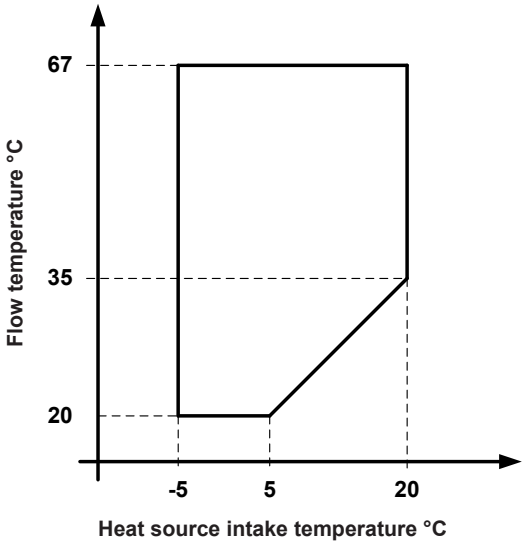
Diagrams of areas of application

Heating and hot water

Thermalia® twin (20-42)

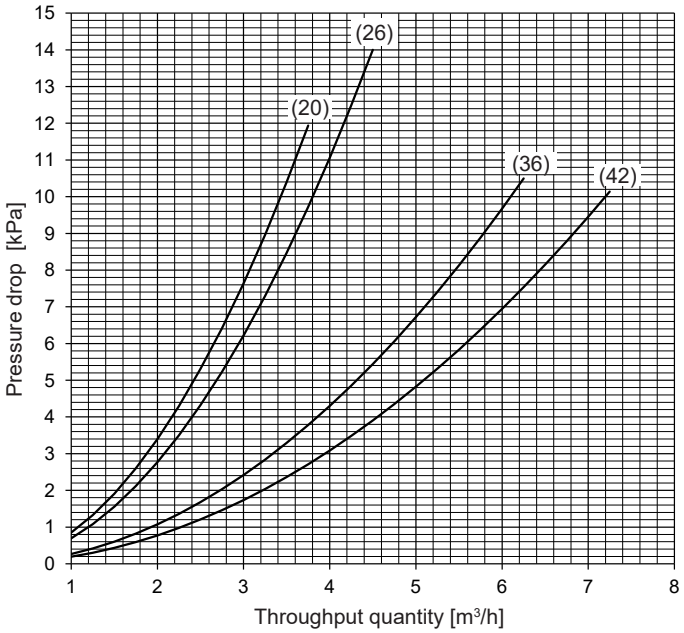


Thermalia® twin H (13-22)



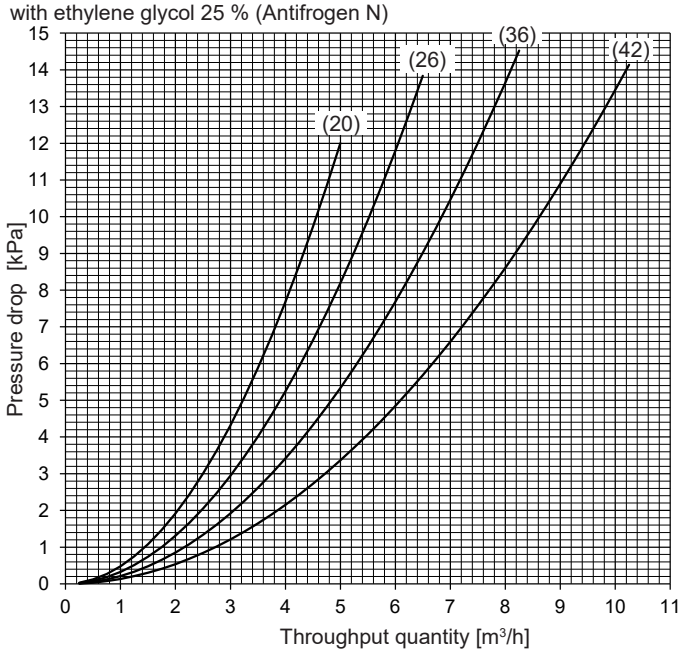
Thermalia® twin (20-42)
Heating

Pressure drop condenser with water



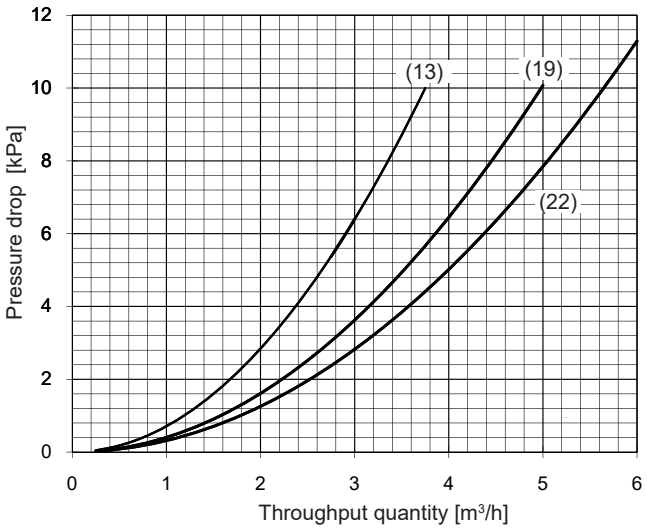
Heat source

Pressure drop evaporator
with ethylene glycol 25 % (Antifrogen N)



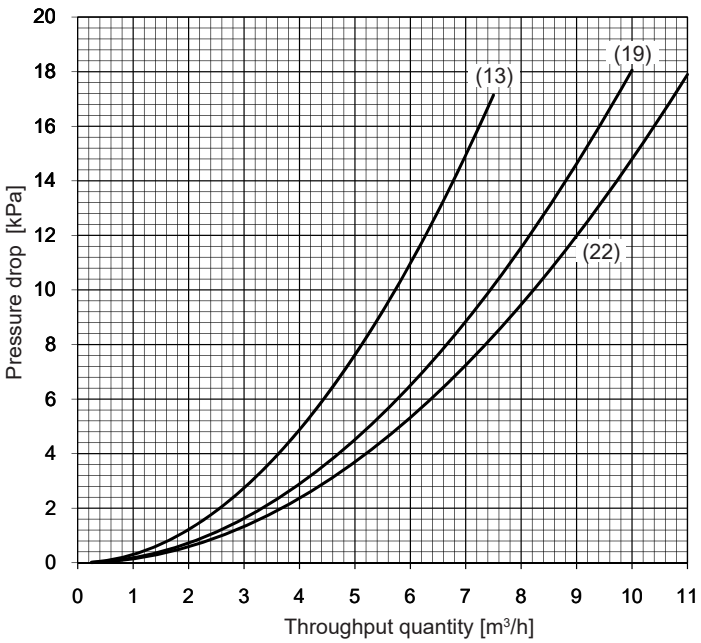
Thermalia® twin H (13-22)
Heating

Pressure drop condenser with water



Heat source

Pressure drop evaporator
with ethylene glycol 25 % (Antifrogen N)

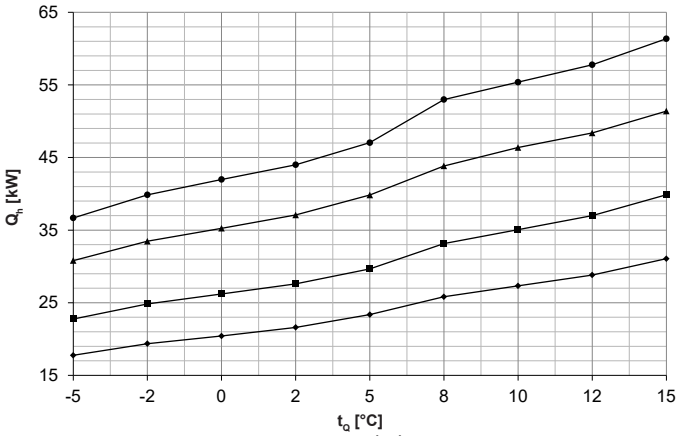


Performance data - heating

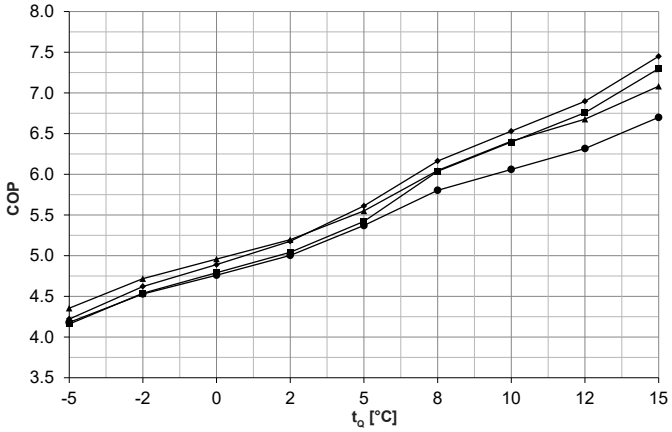
Maximum heat output

Thermalia® twin (20-42)

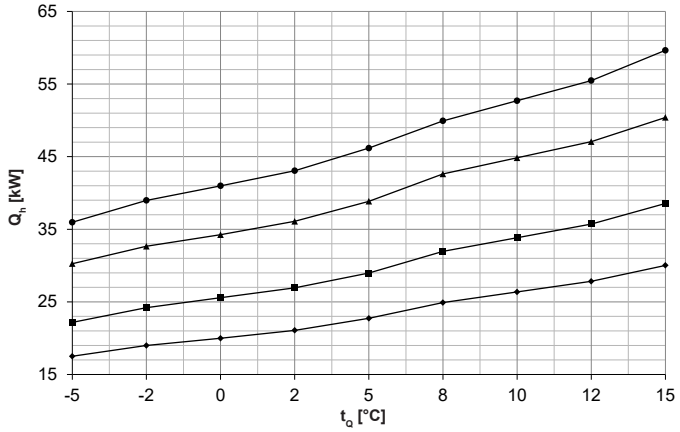
Heat output - t_{VL} 35 °C



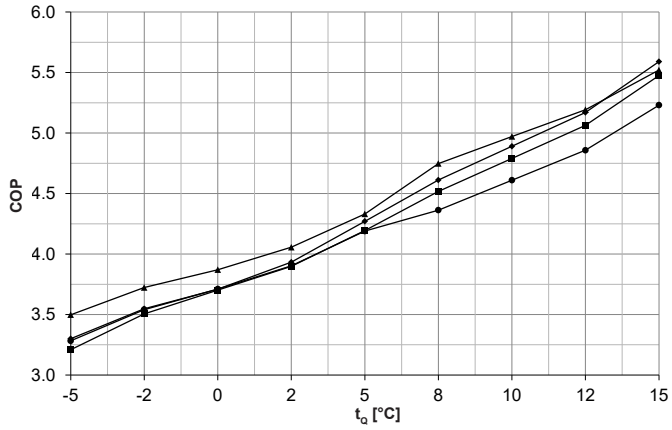
Coefficient of performance - t_{VL} 35 °C



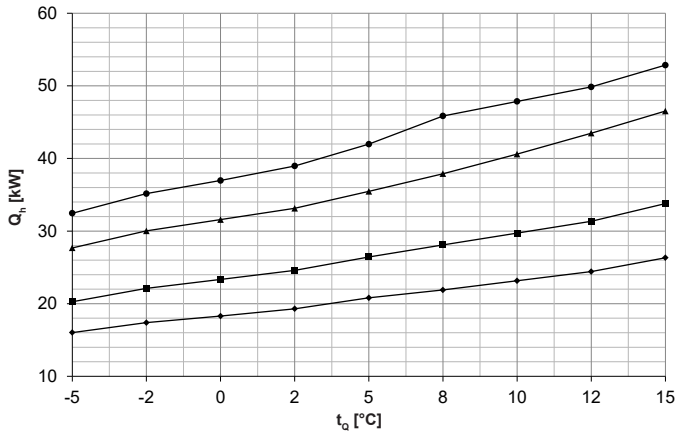
Heat output - t_{VL} 45 °C



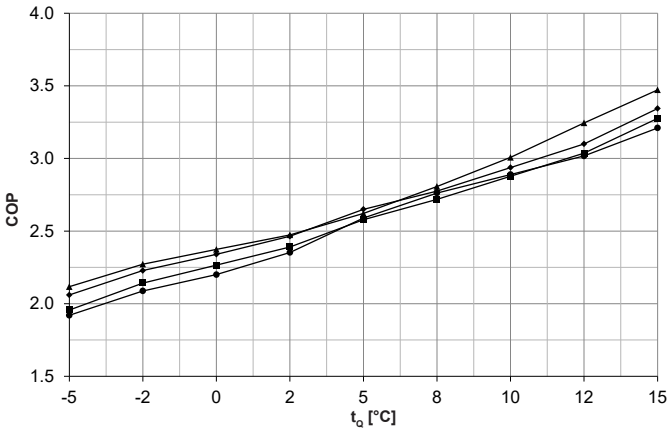
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 60 °C



Coefficient of performance - t_{VL} 60 °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

- Thermalia® twin (20)
- Thermalia® twin (26)
- Thermalia® twin (36)
- Thermalia® twin (42)

Performance data - heating
Thermalia® twin (20-42)
Indications acc. to EN 14511

Type			(20)			(26)			(36)			(42)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP
30	Brine	-5	18.1	3.7	4.9	23.3	4.9	4.8	31.4	6.3	5.0	36.8	7.9	4.7
		-2	19.8	3.7	5.3	25.4	4.9	5.2	34.2	6.3	5.4	40.3	7.9	5.1
		0	20.9	3.7	5.6	26.8	4.9	5.5	36.1	6.3	5.7	42.5	7.9	5.4
		2	22.0	3.7	6.0	28.2	4.8	5.8	38.0	6.3	6.0	44.8	7.9	5.7
		5	23.8	3.7	6.5	30.4	4.8	6.3	40.8	6.3	6.5	48.1	7.9	6.1
	Water	8	26.3	3.6	7.3	33.7	4.7	7.2	44.4	6.4	7.0	54.5	8.0	6.8
		10	27.8	3.6	7.8	35.7	4.7	7.6	47.2	6.4	7.4	56.7	8.0	7.1
		12	29.3	3.6	8.2	37.6	4.7	8.0	49.0	6.3	7.7	58.9	8.0	7.4
		15	31.6	3.6	8.9	40.5	4.7	8.7	51.9	6.3	8.2	62.2	8.0	7.7
35	Brine	-5	17.8	4.2	4.2	22.8	5.5	4.2	30.8	7.1	4.4	36.7	8.8	4.2
		-2	19.4	4.2	4.6	24.8	5.5	4.5	33.5	7.1	4.7	39.9	8.8	4.5
		0	20.4	4.2	4.9	26.2	5.5	4.8	35.3	7.1	5.0	42.0	8.8	4.8
		2	21.6	4.2	5.2	27.6	5.5	5.0	37.1	7.1	5.2	44.0	8.8	5.0
		5	23.4	4.2	5.6	29.7	5.5	5.4	39.8	7.2	5.6	47.0	8.8	5.4
	Water	8	25.8	4.2	6.2	33.1	5.5	6.0	43.8	7.3	6.1	53.0	9.1	5.8
		10	27.3	4.2	6.5	35.1	5.5	6.4	46.4	7.2	6.4	55.4	9.1	6.1
		12	28.8	4.2	6.9	37.0	5.5	6.8	48.4	7.2	6.7	57.8	9.1	6.3
		15	31.1	4.2	7.5	39.9	5.5	7.3	51.4	7.3	7.1	61.4	9.2	6.7
40	Brine	-5	17.6	4.8	3.7	22.5	6.2	3.6	30.5	7.9	3.9	36.3	9.9	3.7
		-2	19.2	4.8	4.0	24.5	6.2	4.0	33.1	7.9	4.2	39.4	9.9	4.0
		0	20.2	4.8	4.2	25.9	6.2	4.2	34.8	8.0	4.4	41.5	9.9	4.2
		2	21.3	4.8	4.5	27.3	6.2	4.4	36.6	8.0	4.6	43.5	9.9	4.4
		5	23.0	4.7	4.9	29.3	6.2	4.7	39.3	8.1	4.9	46.6	9.9	4.7
	Water	8	25.4	4.8	5.3	32.6	6.3	5.2	43.2	8.1	5.3	51.5	10.3	5.0
		10	26.8	4.8	5.6	34.5	6.3	5.5	45.6	8.1	5.6	54.0	10.3	5.3
		12	28.3	4.8	5.9	36.4	6.3	5.8	47.7	8.2	5.9	56.6	10.3	5.5
		15	30.5	4.8	6.4	39.2	6.3	6.3	50.9	8.2	6.2	60.5	10.3	5.9
45	Brine	-5	17.5	5.3	3.3	22.2	6.9	3.2	30.3	8.7	3.5	36.0	11.0	3.3
		-2	19.0	5.4	3.6	24.2	6.9	3.5	32.7	8.8	3.7	39.0	11.0	3.5
		0	20.0	5.4	3.7	25.6	6.9	3.7	34.3	8.9	3.9	41.0	11.0	3.7
		2	21.1	5.4	3.9	26.9	6.9	3.9	36.1	8.9	4.1	43.1	11.0	3.9
		5	22.7	5.3	4.3	29.0	6.9	4.2	38.9	9.0	4.3	46.2	11.0	4.2
	Water	8	24.9	5.4	4.6	32.0	7.1	4.5	42.6	9.0	4.8	49.9	11.4	4.4
		10	26.4	5.4	4.9	33.8	7.1	4.8	44.8	9.0	5.0	52.7	11.4	4.6
		12	27.8	5.4	5.2	35.7	7.1	5.1	47.1	9.1	5.2	55.5	11.4	4.9
		15	30.0	5.4	5.6	38.5	7.0	5.5	50.4	9.1	5.5	59.6	11.4	5.2
50	Brine	-5	17.0	6.0	2.8	21.8	7.8	2.8	29.6	9.6	3.1	34.5	12.5	2.8
		-2	18.4	6.0	3.1	23.6	7.8	3.0	32.1	9.7	3.3	37.4	12.6	3.0
		0	19.4	6.1	3.2	24.9	7.8	3.2	33.8	9.8	3.5	39.4	12.6	3.1
		2	20.4	6.1	3.4	26.1	7.7	3.4	35.2	9.8	3.6	41.6	12.6	3.3
		5	22.0	6.0	3.7	28.0	7.7	3.6	37.2	9.7	3.8	44.7	12.4	3.6
	Water	8	24.0	6.1	3.9	30.8	8.0	3.8	42.1	10.1	4.2	48.7	13.0	3.8
		10	25.4	6.1	4.2	32.6	8.0	4.1	44.2	10.1	4.4	51.3	12.9	4.0
		12	26.8	6.1	4.4	34.4	8.0	4.3	46.3	10.2	4.6	53.8	12.9	4.2
		15	28.9	6.1	4.7	37.1	8.0	4.6	49.5	10.3	4.8	57.6	12.9	4.5
55	Brine	-5	16.4	6.6	2.5	21.4	8.8	2.4	29.0	10.6	2.7	33.0	14.1	2.3
		-2	17.8	6.7	2.7	23.1	8.7	2.7	31.6	10.7	3.0	35.9	14.2	2.5
		0	18.8	6.7	2.8	24.2	8.6	2.8	33.3	10.8	3.1	37.9	14.2	2.7
		2	19.8	6.7	2.9	25.3	8.6	3.0	34.2	10.6	3.2	40.1	14.1	2.8
		5	21.3	6.7	3.2	26.9	8.5	3.2	35.6	10.4	3.4	43.3	13.9	3.1
	Water	8	23.1	6.9	3.4	29.7	9.0	3.3	41.5	11.2	3.7	47.5	14.5	3.3
		10	24.5	6.9	3.6	31.4	9.0	3.5	43.6	11.2	3.9	49.9	14.5	3.5
		12	25.8	6.9	3.8	33.2	9.0	3.7	45.6	11.3	4.0	52.2	14.4	3.6
		15	27.9	6.8	4.1	35.8	9.0	4.0	48.6	11.4	4.3	55.7	14.4	3.9
60	Brine	-5	16.0	7.8	2.1	20.3	10.4	2.0	27.7	13.1	2.1	32.5	16.9	1.9
		-2	17.4	7.8	2.2	22.1	10.3	2.1	30.0	13.2	2.3	35.2	16.8	2.1
		0	18.3	7.8	2.3	23.3	10.3	2.3	31.6	13.3	2.4	37.0	16.8	2.2
		2	19.3	7.8	2.5	24.6	10.3	2.4	33.1	13.4	2.5	39.0	16.6	2.4
		5	20.8	7.9	2.7	26.4	10.3	2.6	35.5	13.5	2.6	42.0	16.2	2.6
	Water	8	21.9	7.9	2.8	28.1	10.3	2.7	37.9	13.5	2.8	45.9	16.6	2.8
		10	23.2	7.9	2.9	29.7	10.3	2.9	40.6	13.5	3.0	47.9	16.6	2.9
		12	24.4	7.9	3.1	31.4	10.3	3.0	43.5	13.4	3.2	49.9	16.5	3.0
		15	26.3	7.9	3.3	33.8	10.3	3.3	46.5	13.4	3.5	52.9	16.5	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 of the overall unit (kW)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

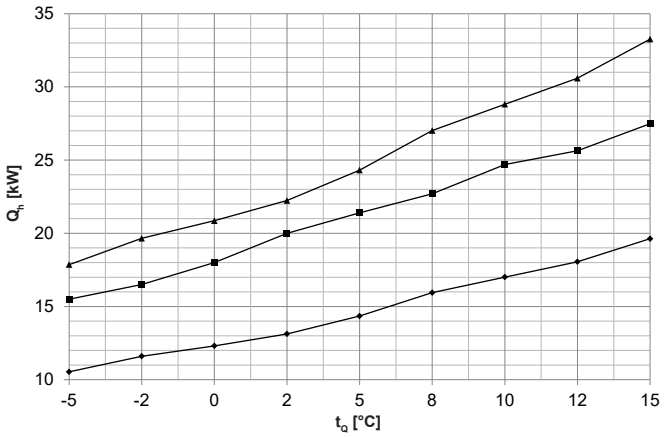
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - heating

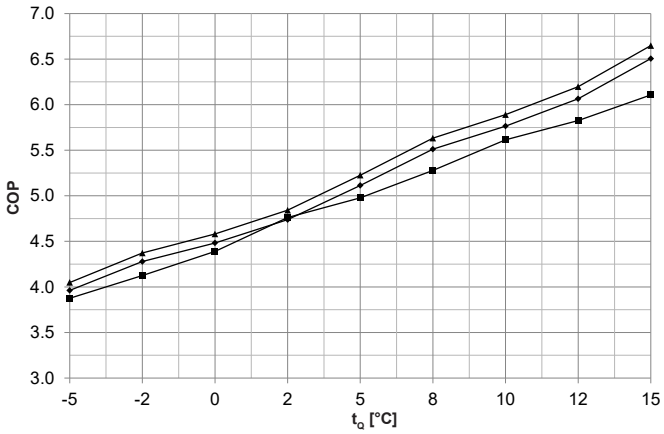
Maximum heat output

Thermalia® twin H (13-22)

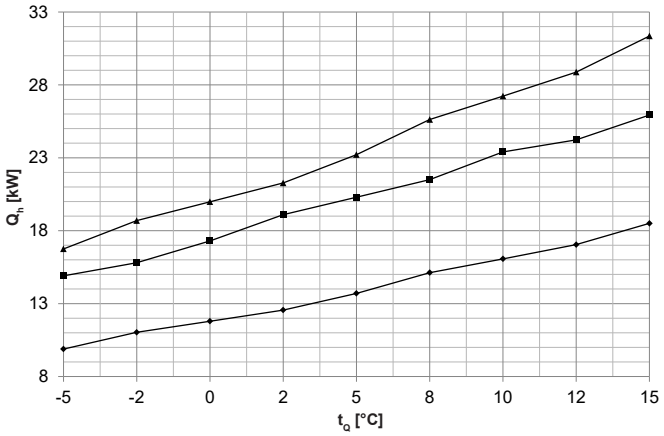
Heat output - t_{VL} 35 °C



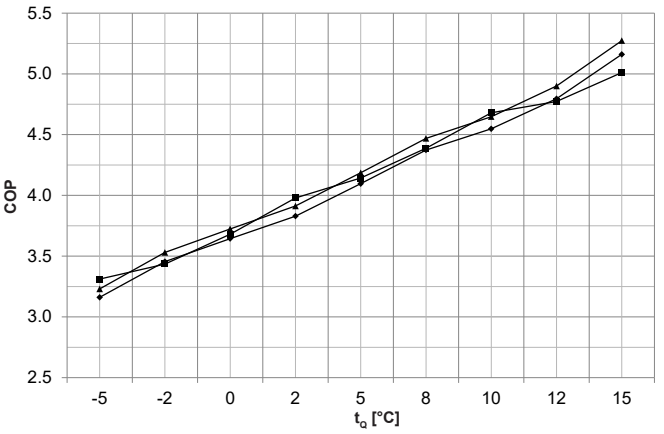
Coefficient of performance - t_{VL} 35 °C



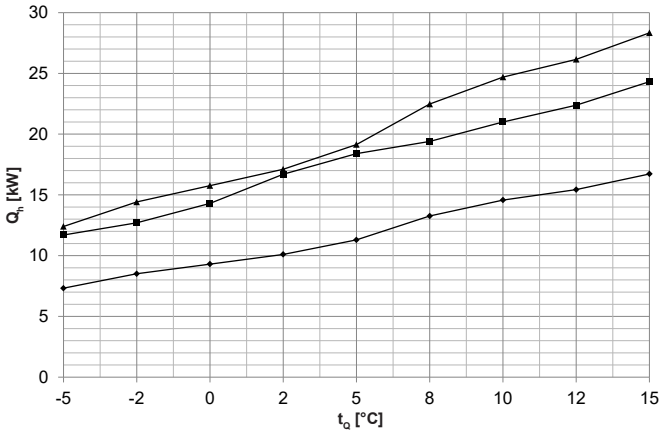
Heat output - t_{VL} 45 °C



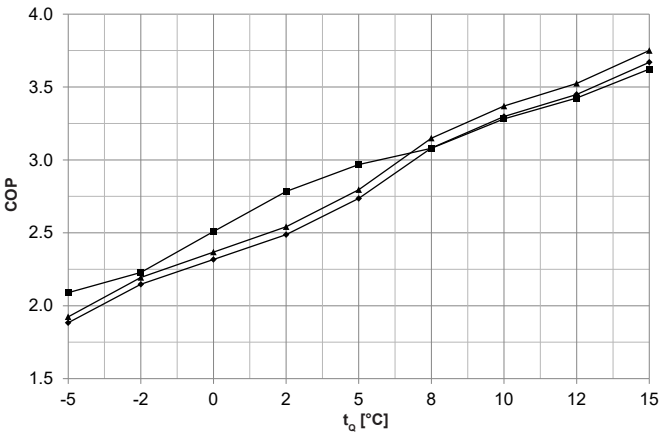
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 60 °C



Coefficient of performance - t_{VL} 60 °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

Thermalia® twin H (13)
Thermalia® twin H (19)
Thermalia® twin H (22)

Performance data - heating
Thermalia® twin H (13-22)

Indications acc. to EN 14511

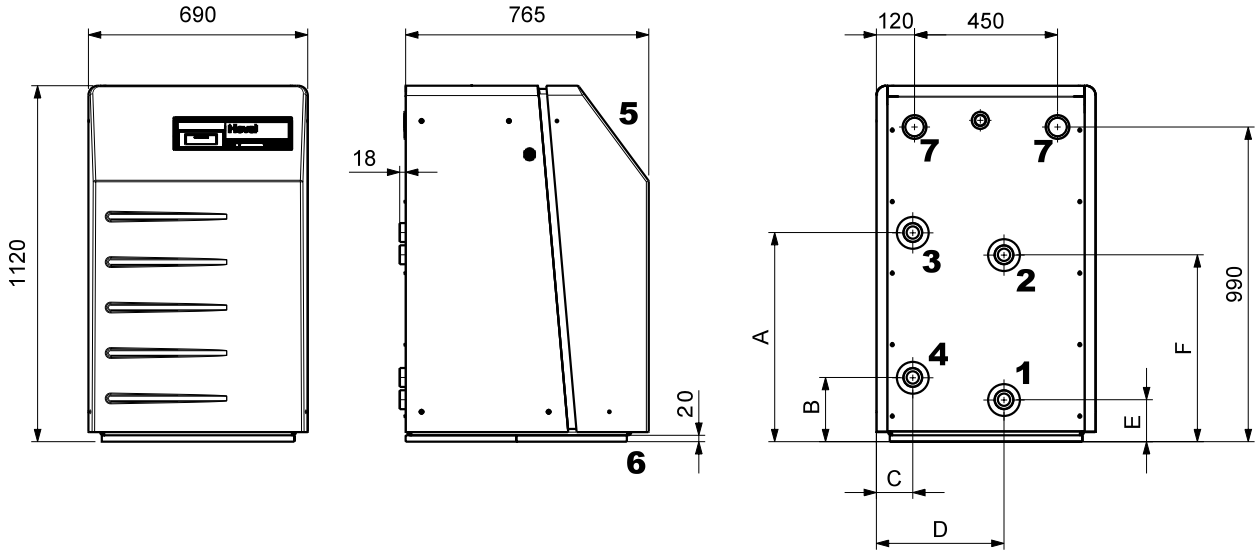
Type			H (13)			H (19)			H (22)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP
30	Brine	-5	10.9	2.4	4.5	15.8	3.5	4.5	18.4	4.0	4.6
		-2	11.9	2.5	4.8	16.8	3.7	4.5	20.1	4.1	4.9
		0	12.6	2.5	5.0	18.4	3.7	5.0	21.3	4.1	5.1
		2	13.4	2.5	5.3	20.5	3.8	5.4	22.7	4.2	5.5
		5	14.7	2.5	5.8	22.0	3.9	5.6	24.9	4.2	5.9
	Water	8	16.4	2.6	6.3	24.0	4.0	6.0	27.7	4.3	6.4
		10	17.5	2.7	6.6	25.3	4.0	6.3	29.6	4.4	6.7
		12	-	-	-	-	-	-	-	-	-
		15	-	-	-	-	-	-	-	-	-
35	Brine	-5	10.5	2.7	4.0	15.5	4.0	3.9	17.9	4.4	4.1
		-2	11.6	2.7	4.3	16.5	4.0	4.1	19.7	4.5	4.4
		0	12.3	2.7	4.5	18.0	4.1	4.4	20.9	4.6	4.6
		2	13.1	2.8	4.7	20.0	4.2	4.8	22.2	4.6	4.8
		5	14.3	2.8	5.1	21.4	4.3	5.0	24.3	4.7	5.2
	Water	8	15.9	2.9	5.5	22.7	4.3	5.2	27.0	4.8	5.6
		10	17.0	3.0	5.8	24.7	4.4	5.6	28.8	4.9	5.9
		12	18.1	3.0	6.1	25.6	4.4	5.8	30.6	4.9	6.2
		15	19.6	3.0	6.5	27.5	4.5	6.1	33.3	5.0	6.7
40	Brine	-5	10.2	2.9	3.5	15.1	4.4	3.4	17.3	4.8	3.6
		-2	11.3	3.0	3.8	16.1	4.4	3.7	19.2	4.9	3.9
		0	12.1	3.0	4.0	17.6	4.5	3.9	20.4	5.0	4.1
		2	12.8	3.0	4.3	19.5	4.6	4.2	21.8	5.0	4.3
		5	14.0	3.1	4.6	20.8	4.7	4.4	23.8	5.1	4.7
	Water	8	15.5	3.2	4.9	22.0	4.8	4.6	26.3	5.3	5.0
		10	16.5	3.2	5.1	24.0	4.8	5.0	28.0	5.4	5.2
		12	17.5	3.3	5.4	25.1	4.9	5.1	29.7	5.4	5.5
		15	19.1	3.3	5.8	26.8	5.0	5.4	32.3	5.5	5.9
45	Brine	-5	9.9	3.1	3.2	14.9	4.5	3.3	16.8	5.2	3.2
		-2	11.0	3.2	3.5	15.8	4.6	3.4	18.7	5.3	3.5
		0	11.8	3.2	3.6	17.3	4.7	3.7	20.0	5.4	3.7
		2	12.6	3.3	3.8	19.1	4.8	4.0	21.3	5.4	3.9
		5	13.7	3.3	4.1	20.3	4.9	4.1	23.2	5.5	4.2
	Water	8	15.1	3.5	4.4	21.5	4.9	4.4	25.6	5.7	4.5
		10	16.1	3.5	4.6	23.4	5.0	4.7	27.2	5.9	4.7
		12	17.0	3.6	4.8	24.2	5.1	4.8	28.9	5.9	4.9
		15	18.5	3.6	5.2	25.9	5.2	5.0	31.4	5.9	5.3
50	Brine	-5	9.0	3.4	2.7	13.8	4.9	2.8	15.3	5.6	2.7
		-2	10.2	3.4	3.0	14.8	4.9	3.0	17.3	5.7	3.0
		0	11.0	3.5	3.1	16.3	5.0	3.3	18.6	5.8	3.2
		2	11.7	3.5	3.3	18.3	5.2	3.5	19.9	5.9	3.4
		5	12.9	3.6	3.6	19.7	5.3	3.7	21.9	6.0	3.7
	Water	8	14.5	3.7	3.9	20.8	5.4	3.9	24.6	6.2	4.0
		10	15.6	3.8	4.1	22.6	5.4	4.2	26.4	6.3	4.2
		12	16.5	3.9	4.3	23.6	5.5	4.3	28.0	6.4	4.4
		15	17.9	3.9	4.6	25.4	5.6	4.5	30.3	6.5	4.7
55	Brine	-5	8.2	3.6	2.3	12.8	5.2	2.5	13.9	6.0	2.3
		-2	9.3	3.7	2.5	13.8	5.3	2.6	15.8	6.1	2.6
		0	10.1	3.8	2.7	15.3	5.4	2.8	17.2	6.2	2.8
		2	10.9	3.8	2.9	17.5	5.6	3.1	18.5	6.3	2.9
		5	12.1	3.9	3.1	19.0	5.7	3.3	20.5	6.4	3.2
	Water	8	13.9	4.0	3.5	20.1	5.8	3.5	23.5	6.7	3.5
		10	15.1	4.1	3.7	21.8	5.9	3.7	25.5	6.8	3.7
		12	16.0	4.2	3.8	23.0	6.0	3.8	27.1	6.9	3.9
		15	17.3	4.2	4.1	24.8	6.2	4.0	29.3	7.0	4.2
60	Brine	-5	7.3	3.9	1.9	11.7	5.6	2.1	12.4	6.4	1.9
		-2	8.5	4.0	2.2	12.7	5.7	2.2	14.4	6.6	2.2
		0	9.3	4.0	2.3	14.3	5.7	2.5	15.8	6.7	2.4
		2	10.1	4.1	2.5	16.7	6.0	2.8	17.1	6.7	2.5
		5	11.3	4.1	2.7	18.4	6.2	3.0	19.1	6.8	2.8
	Water	8	13.3	4.3	3.1	19.4	6.3	3.1	22.5	7.1	3.2
		10	14.6	4.4	3.3	21.0	6.4	3.3	24.7	7.3	3.4
		12	15.4	4.5	3.5	22.4	6.5	3.4	26.2	7.4	3.5
		15	16.7	4.6	3.7	24.3	6.7	3.6	28.3	7.6	3.8

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 of the 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”

Thermalia® twin (20-42) and twin H (13-22)

(Dimensions in mm)



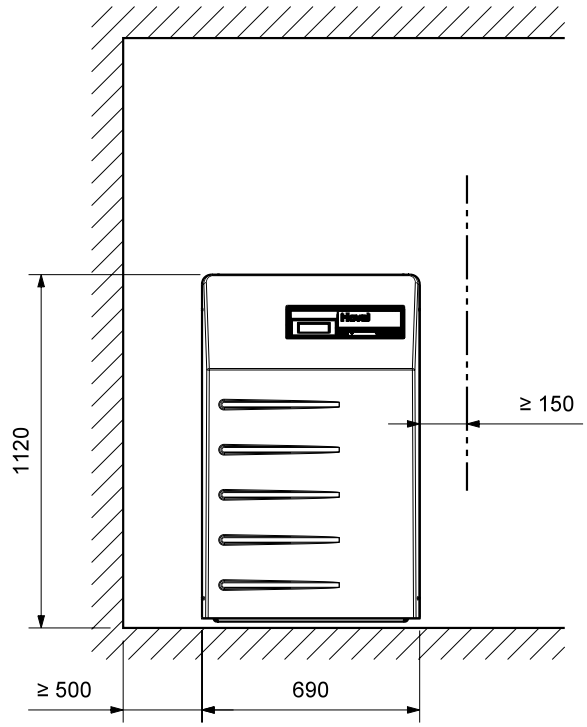
Type	A	B	C	D	E	F
Thermalia® twin (20-42)	741	222	274.5	481.5	170	689
Thermalia® twin H (13-22)	658	202	114	401	132	588

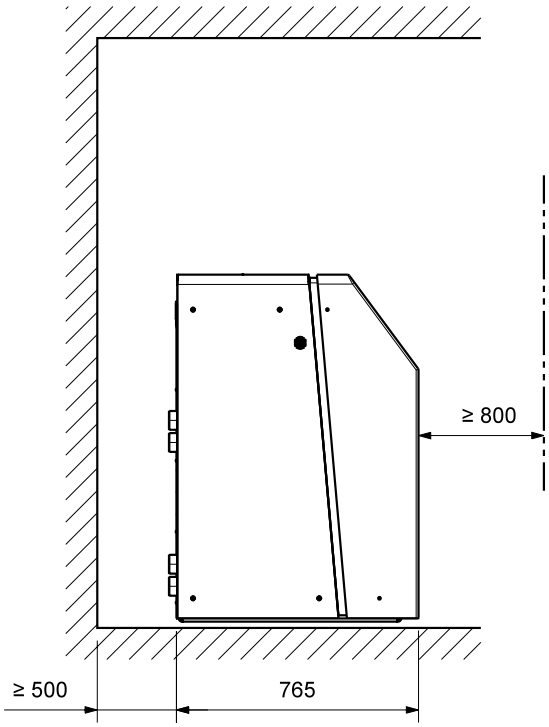
1 Heat source - discharge R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heat source - discharge R 2″
Thermalia® twin (36,42), twin H (22)
2 Heat source - inlet R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heat source - inlet R 2″
Thermalia® twin (36,42), twin H (22)
3 Heating flow R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heating flow R 2″
Thermalia® twin (36,42), twin H (22)
4 Heating return R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heating return R 2″
Thermalia® twin (36,42), twin H (22)
5 Operating panel
6 Vibration damping
7 Electrical connection

Required space

Required wall distance in mm for operation and maintenance
(Dimensions in mm)

Front	Rear	Right or left side
min. 800	min. 500	min. 500





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

Hoval Thermalia® dual

Brine/water-water/water heat pump

- Compact unit with high energy efficiency
- Extremely quiet running thanks to 3-bearing construction
- Stable steel frame structure, a ground plate including vibration-free machine adjustable feet
- Removable, powder-coated sheet steel side panels and front doors with quick-release fasteners
- All casing parts are sound-insulated and thermally insulated
- Colour of side panels, ceiling and rear side: brown red (RAL 3011)
- Colour of doors: flame red (RAL 3000)
- 2 spiral (scroll) compressors
- With plate heat exchanger (condenser and evaporator) made of stainless steel (1.4401), soldered
- Two separate refrigeration circuits with electronic expansion valves, filter dryer with sight glass, liquid receivers and high-pressure and low-pressure sensors
- Electronic initial current limiter with rotating field and phase monitoring
- Integrated brine pressure monitoring
- Two output levels
- Refrigerants
  Thermalia® dual, dual R (55-140) with 410A
  Thermalia® dual H (35-90) with R134a
- Heat pump wired and ready to connect
- Operating side on front with integrated TopTronic® E controller

Electrical connections

- Connection at rear

Delivery

- Heat pump pre-assembled and packed

TopTronic® E controller

Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- 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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

Model range

Thermalia® dual type	Water/water 35 °C	Water/water 55 °C	Brine/water 35 °C	Brine/water 55 °C	Refrigerant	Flow min. °C	Flow max. °C	Heat output B0W35 kW	Heat output W10W35 kW	Cooling capacity B17W9 kW	Cooling capacity B25W18 kW
(55)	A+++	A+++	A+++	A++	2 x R410A	-	62	57.9	76.9	-	-
(70)			A+++	A++	2 x R410A	-	62	73.2	97.2	-	-
(85)					2 x R410A	-	62	84.8	112.8	-	-
(110)					2 x R410A	-	62	113.4	149.1	-	-
(140)					2 x R410A	-	62	137.8	181.1	-	-
H (35)	A+++	A+++	A+++	A++	2 x R134a	-	70	34.9	49.3	-	-
H (50)	A+++	A+++	A+++	A++	2 x R134a	-	70	52.5	71.8	-	-
H (70)			A+++	A++	2 x R134a	-	70	70.9	97.1	-	-
H (90)					2 x R134a	-	70	87.3	119.5	-	-
R (55)	A+++	A+++	A+++	A++	2 x R410A	7	62	57.9	76.7	64.7	81.1
R (70)			A+++	A++	2 x R410A	7	62	73.2	97.2	86.2	108.3
R (85)					2 x R410A	7	62	84.8	112.8	107.0	127.7
R (110)					2 x R410A	7	62	113.4	149.1	138.1	165.0
R (140)					2 x R410A	7	62	137.8	181.1	156.9	183.9

Energy efficiency class of the compound system with control

TopTronic® E basic module heat generator TTE-WEZ

- Control functions integrated 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
  - module expansion heat balancing
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

Number of modules that can be additionally 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.

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

Brine/water or water/water heat pump

Hoval Thermalia® dual

Refrigerant R410A, 2 circuits.
Max. flow temperature 62 °C

Thermalia® dual type	Heat output for B0W35 kW	for W10W35 kW	Part No.
(55)	57.9	76.9	7018 997
(70)	73.2	97.2	7018 998
(85)	84.8	112.8	7018 999
(110)	113.4	149.1	7014 294
(140)	137.8	181.1	7014 295

Hoval Thermalia® dual H

Refrigerant R134a, 2 circuits.
Max. flow temperature 70 °C

Thermalia® dual H type	Heat output for B0W35 kW	for W10W35 kW	Part No.
H (35)	34.9	49.3	7019 003
H (50)	52.5	71.8	7019 004
H (70)	70.9	97.1	7019 005
H (90)	87.3	119.5	7014 299

Hoval Thermalia® dual R

Refrigerant R410A, 2 circuits.
Max. flow temperature 62 °C

Thermalia® dual R type	Cooling capacity [1] for B17W9 kW	for B25W18 kW	Part No.
R (55)	64.7	81.1	7019 000
R (70)	86.2	108.3	7019 001
R (85)	107.0	127.7	7019 002
R (110)	138.1	165.0	7016 553
R (140)	156.9	183.9	7016 554

[1] Heat output: see Hoval Thermalia® dual

Notice
Suitable heat source and charging pumps:

Hoval system pump set SPS-I with interface for pump control
Type 0-10 V or PWM1

Premium pump Stratos
with IF module Stratos Ext. Off (0-10 V)

See “Circulating pumps”

Energy efficiency class
see Description

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

Further information
see “Description”

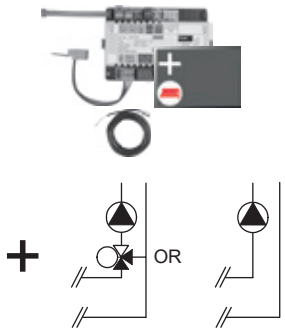
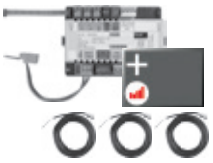
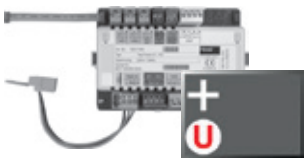
Seal of approval FWS
The Thermalia® dual R series does NOT have an ehpa certificate.

Accessories

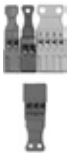
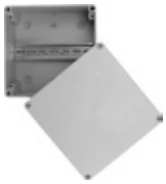
		Part No.
	**Hose set SPCH50-50-10-4** for Thermalia® dual (55-85), dual H (35-70), dual R (55-85) Consisting of: - 4 reinforced hoses PN 10 DN 50 2″ IT insulated for brine and heating side flat-sealing with union nut - Length: 1.0 m - Seals	6058 825
	**Set of sound attenuation feet 65/75** for Thermalia® dual (55,70), dual H (35,50), dual R (55,70) for reducing the transmission of solid-borne noise Set consisting of 4 vibration-damping adjustable feet, threaded rod and locknut Elastomer part material: NR, black Housing material: galvanised steel, chromated	6045 228
	**Set of sound attenuation feet 45/55** for Thermalia® dual (85-140), dual H (70,90), dual R (85-140) for reducing the transmission of solid-borne noise Set consisting of 4 vibration-damping adjustable feet, threaded rod and locknut Elastomer part material: NR, black Housing material: galvanised steel, chromated	6045 229

TopTronic® E module expansions

for TopTronic® E basic module heat generator

		Part No.
	**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!	6034 576
	**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** Suitable flow rate sensors (pulse sensors) must be provided on site.	6037 062
	**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” - “Hoval TopTronic® E module expansions” chapter **Notice** Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.	6034 575

Accessories for TopTronic® E

		Part No.
	**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
	**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
	**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

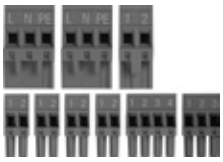
		Part No.
	**Flange compensator set DN 80 PN 6** for Thermalia® dual (110-140), dual H (90), dual R (110-140) for reducing the transmission of solid-borne and fluid-borne noise Set consisting of 4 flange compensators DN 80 PN 6 without fittings Structural length:130 mm	6040 025
	**System water protection filter FF050-200** Cast-iron casing with opposite connection flanges at same height for filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure loss. Consisting of: Casing and cover made of cast iron GGG-50 Cover with clip lock - Filter strainer insert made of stainless steel - Cover seal made of NBR - 2 magnetic inserts (nickel-neodymium) - 2 pressure gauges - Very large Filter surface made of stainless steel - Filter fineness 200 µm - With filling and drain valve - Connections flange DN 50 - Nominal pressure: 10 bar Max. flow rate: ($\Delta p < 0.1$ bar): 18 m³/h Weight: 15 kg Water temperature max. 80 °C	2076 376

Strainers
see “Various system components”

Float body flow meter
Bistable Reed contact as NC contact
Nominal pressure: 10 bar
Installation length: 335 mm

Area of application l/h	°C	Connection	Part No.
1500-15000	0-80	Rp 2″	2040 709
3000-30000	0-80	DN 65	2064 164
8000-60000	0-80	DN 65	2064 165

For active cooling, the installation of a flow controller is mandatory!



Expansion connector set — Part No. 6032 509
for the automatic heat pump device ECR461
Use for additional function:
- Flow monitor
- Crankcase bottom heating
(included in the scope of delivery
for Belaria® twin A, twin AR, dual AR)
- Condensation drain heating
- Heat quantity metering
Plugs:
- 1 230 V digital input
- 2 230 V outputs
- 4 low-voltage inputs
- 1 ratio. Input
- 1 4-pin low-voltage input

Frost protection temperature switch 270XT-95068 — Part No. 2007 313
to heat source ground water
Type of protection: IP 40
Area of application: -24/18 °C

Service

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.

Thermalia® dual (55-140) with R410A

Type		(55)	(70)	(85)	(110)	(140)
Brine/water application B0W35						
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	-	-	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	195	193	194	194	193
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	138	140	142	141	141
Water/water application W10W35						
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	-	-	-	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	257	249	250	242	245
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	185	180	181	177	178
• Seasonal coefficient of performance moderate climate (brine) 35 °C/55 °C	SCOP	5.1/3.7	5.0/3.7	5.1/3.7	5.1/3.7	5.0/3.7
Max. performance data heating in acc. with EN 14511						
• Heat output B0W35	kW [3)]	57.9	73.2	84.8	113.4	137.8
• Coefficient of performance B0W35	COP	4.6	4.6	4.6	4.6	4.6
• Heat output W10W35	kW	76.9	97.2	112.8	149.1	181.1
• Coefficient of performance W10W35	COP	6.1	5.9	5.9	5.7	5.8
Sound data according to EN 12102						
• Sound power level	dB(A)	57.2	55.7	57.2	64.2	64.2
Hydraulic data brine/water B0W35						
• Maximum flow temperature	°C	62	62	62	62	62
• Maximum operating pressure	bar	16	16	16	6	6
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m^3/h	9.9	12.6	14.6	19.5	23.7
• Pressure drop, condenser	kPa	5.7	6.2	5.4	7.6	8.1
• Condenser connections	R (ext. thread)	2″	2“	2″	DN 80/PN 6	DN 80/PN 6
• Brine spread	K	3	3	3	3	3
• Required volume flow	m^3/h	13.7	17.3	20.1	26.7	32.6
• Pressure drop, evaporator	kPa	15.8	10.0	11.2	12.8	11.3
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
Hydraulic data water/water W10/W35 (intermediate circuit)						
• Maximum flow temperature	°C	62	62	62	62	62
• Maximum operating pressure	bar	16	16	16	6	6
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m^3/h	13.2	16.7	19.4	25.6	31.1
• Pressure drop, condenser	kPa	9.8	10.6	9.3	12.6	13.4
• Condenser connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
• Brine spread in intermediate circuit [4)]	K	3	4	4	4	5
• Required volume flow GW	m^3/h	20.9	19.7	22.9	30.1	29.3
• Pressure drop, evaporator	kPa	28.3	17.2	19.8	22.8	18.6
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
Refrigerating data						
• Refrigerant		R410A	R410A	R410A	R410A	R410A
• Refrigerant filling quantity	kg	2 x 6.0	2 x 7.4	2 x 8.2	2 x 10.0	2 x 10.7
• Compressor oil filling quantity	l	2 x 2.46	2 x 3.30	2 x 3.60	2 x 6.70	2 x 6.70
- Type of compressor oil: DAPHNE HERMETIC OIL FVC32D for dual (55), EMKARATE® RL 32HB - 160SZ - 160Z for dual (70-140)						
Electrical data						
• Power supply	V	3+N~400 V/50 Hz				
• Max. power consumption (without pumps)	kW	24.8	30.4	34.6	46.6	56.6
• Max. operating current (without pumps)	A	45.6	51.0	58.2	75.6	93.2
• Max. starting current	A	85.3	100.5	114.1	160.3	186.6
• Main current fuse (on site)	A	C63	C63	C80	C100	C125
• Control current fuse (on site)	A	16	16	16	16	16
Dimensions/weight						
• Dimensions (H x W x D)	mm	1907 x 1066 x 774			1907 x 1316 x 774	
• Minimum size of the installation room (without ventilation)	m^3	16	17	19	26	31
• Weight	kg	560	620	700	770	820

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4)] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

Thermalia® dual H (35-90) with R134a

Type		H (35)	H (50)	H (70)	H (90)
Brine/water application B0W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	A+++/A++	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	177	182	182	178
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	130	135	132	131
Water/water application W10W35					
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++	-	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	254	246	245	240
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	179	179	177	174
• Seasonal coefficient of performance moderate climate (brine) 35 °C/55 °C	SCOP	4.6/3.5	4.8/3.6	4.8/3.5	4.7/3.5
Max. performance data heating in acc. with EN 14511					
• Heat output B0W35	kW [3)]	34.9	52.5	70.9	87.3
• Coefficient of performance B0W35	COP	4.3	4.4	4.4	4.3
• Heat output W10W35	kW	49.3	71.8	97.1	119.5
• Coefficient of performance W10W35	COP	6.0	5.8	5.8	5.7
Sound data according to EN 12102					
• Sound power level	dB(A)	55.2	60.2	63.2	63.2
Hydraulic data brine/water B0W35					
• Maximum flow temperature	°C	70	70	70	70
• Maximum operating pressure	bar	16	16	16	6
• Heating water spread	K	5	5	5	5
• Required volume flow	m^3/h	6.0	9.0	12.2	15.0
• Pressure drop, condenser	kPa	4.2	3.3	3.9	4.7
• Condenser connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6
• Brine spread	K	3	3	3	3
• Required volume flow	m^3/h	8.1	12.2	16.5	20.2
• Pressure drop, evaporator	kPa	8.9	9.1	8.3	8.8
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6
Hydraulic data water/water W10/W35 (intermediate circuit)					
• Maximum flow temperature	°C	70	70	70	70
• Maximum operating pressure	bar	16	16	16	6
• Heating water spread	K	5	5	5	5
• Required volume flow	m^3/h	8.5	12.3	16.7	20.5
• Pressure drop, condenser	kPa	7.8	6.0	7.0	8.4
• Condenser connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6
• Brine spread in intermediate circuit [4)]	K	3	3	4	4
• Required volume flow GW	m^3/h	13.4	19.4	19.6	24.1
• Pressure drop, evaporator	kPa	18.2	16.8	15.2	15.9
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6
Refrigerating data					
• Refrigerant		R134a	R134a	R134a	R134a
• Refrigerant filling quantity	kg	2 x 5.4	2 x 8.0	2 x 8.2	2 x 9.0
• Compressor oil filling quantity	l	2 x 3.3	2 x 6.2	2 x 8.0	2 x 8.0
- Type of compressor oil: DAPHNE HERMETIC OIL FVC32D for dual H (35), EMKARATE(TM) RL 32HB - 160SZ - 160Z for dual H (50-90)					
Electrical data					
• Power supply	V		3+N~400 V/50 Hz		
• Max. power consumption (without pumps)	kW	17.4	25.6	34.8	44.2
• Max. operating current (without pumps)	A	32.0	45.6	58.6	75.8
• Max. starting current	A	76.0	107.8	151.8	182.9
• Main current fuse (on site)	A	C50	C63	C80	C100
• Control current fuse (on site)	A	16	16	16	16
Dimensions/weight					
• Dimensions (H x W x D)	mm	1907 x 1066 x 774		1907 x 1316 x 774	
• Minimum size of the installation room (without ventilation)	m^3	22	24	27	36
• Weight	kg	670	700	770	800

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

[3)] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4)] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

Thermalia® dual R (55-140) with R410A

Type		R (55)	R (70)	R (85)	R (110)	R (140)
Brine/water application B0W35						
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A++	A+++/A++	-	-	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	195	193	194	194	193
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	138	140	142	141	141
Water/water application W10W35						
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	-	-	-	-
• Room heating energy efficiency “moderate climate” 35 °C ηS [1), 2)]	%	257	249	250	242	245
• Room heating energy efficiency “moderate climate” 55 °C ηS [1), 2)]	%	185	180	181	177	178
• Seasonal coefficient of performance moderate climate (brine) 35 °C/55 °C	SCOP	5.1/3.7	5.0/3.7	5.1/3.7	5.1/3.7	5.0/3.7
Max. performance data heating and cooling in acc. with EN 14511						
• Heat output B0W35	kW [3)]	57.9	73.2	84.8	113.4	137.8
• Coefficient of performance B0W35	COP	4.63	4.6	4.63	4.62	4.61
• Heat output W10W35	kW	76.9	97.2	112.8	149.1	181.1
• Coefficient of performance W10W35	COP	6.07	5.87	5.91	5.73	5.79
• Cooling capacity B17W9	kW	64.7	86.2	107	138.1	156.9
• Energy efficiency ratio B17W9	EER	6.12	6.6	7.21	6.51	6.05
• Cooling capacity B25W18	kW	81.1	108.3	127.7	165	183.9
• Energy efficiency ratio B25W18	EER	6.44	6.71	6.95	6.31	6.04
Sound data according to EN 12102						
• Sound power level	dB(A)	57.2	55.7	57.2	64.2	64.2
Hydraulic data brine/water B0W35						
• Maximum flow temperature	°C	62	62	62	62	62
• Maximum operating pressure	bar	16	16	16	6	6
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m^3/h	9.9	12.6	14.6	19.5	23.7
• Pressure drop, condenser	kPa	5.7	6.2	5.4	7.6	8.1
• Condenser connections	R (ext. thread)	2″	2“	2″	DN 80/PN 6	DN 80/PN 6
• Brine spread	K	3	4	4	4	5
• Required volume flow	m^3/h	14.8	14.0	16.3	20.9	21.1
• Pressure drop, evaporator	kPa	15.8	10.0	11.2	12.8	11.3
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
Hydraulic data water/water W10/W35 (intermediate circuit)						
• Maximum flow temperature	°C	62	62	62	62	62
• Maximum operating pressure	bar	16	16	16	6	6
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m^3/h	13.2	16.7	19.4	25.6	31.1
• Pressure drop, condenser	kPa	9.8	10.6	9.3	12.6	13.4
• Condenser connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
• Brine spread in intermediate circuit [4)]	K	3	4	4	4	5
• Required volume flow GW	m^3/h	20.9	19.7	22.9	30.1	29.3
• Pressure drop, evaporator	kPa	28.3	17.2	19.8	22.8	18.6
• Evaporator connections	R (ext. thread)	2″	2″	2″	DN 80/PN 6	DN 80/PN 6
Refrigerating data						
• Refrigerant		R410A	R410A	R410A	R410A	R410A
• Refrigerant filling quantity	kg	2 x 6.0	2 x 7.4	2 x 8.2	2 x 10.0	2 x 10.7
• Compressor oil filling quantity	l	2 x 2.46	2 x 3.3	2 x 3.6	2 x 6.7	2 x 6.7
- Type of compressor oil: DAPHNE HERMETIC OIL FVC32D for dual R (55), EMKARATE(TM) RL 32HB - 160SZ - 160Z for dual R (70-140)						
Electrical data						
• Power supply	V	3+N~400 V/50 Hz				
• Max. power consumption (without pumps)	kW	24.8	30.4	34.6	46.6	56.6
• Max. operating current (without pumps)	A	45.6	51	58.2	75.6	93.2
• Max. starting current	A	85.3	100.5	114.1	160.3	186.6
• Main current fuse (on site)	A	C63	C63	C80	C100	C125
• Control current fuse (on site)	A	16	16	16	16	16
Dimensions/weight						
• Dimensions (H x W x D)	mm	1907 x 1066 x 774			1907 x 1316 x 774	
• Minimum size of the installation room (without ventilation)	m^3	27.2	33.6	37.3	45.5	48.6
• Weight	kg	560	620	700	770	820

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

[2)] 4 % can be added for class IV heat pump incl. control and room thermostat.

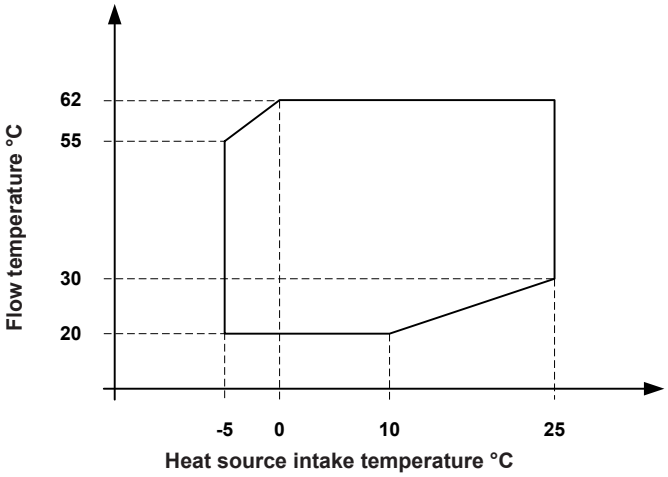
[3)] kW = standard values according to EN 14511; values for B0W35 with 25 % monopolypropylene

[4)] ΔT in accordance with regional regulations. The temperature difference is adjustable from 3 to 6 kelvin. The pump regulates the volumetric current to the set temperature difference.

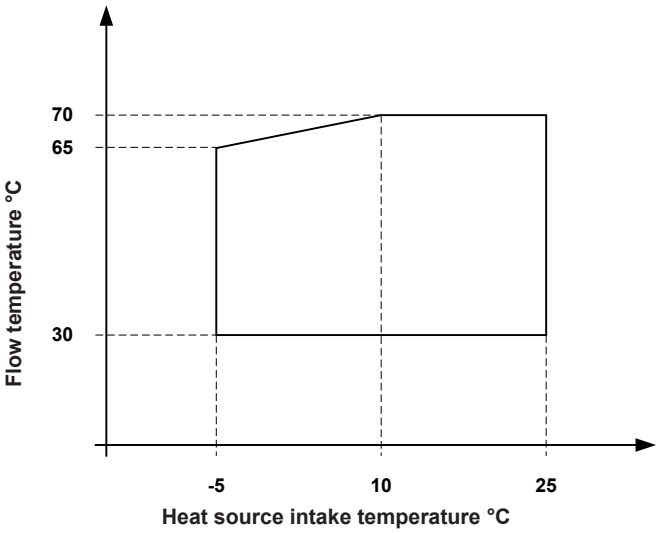
Diagrams of areas of application

Heating and hot water

Thermalia® dual (55-140), dual R (55-140)

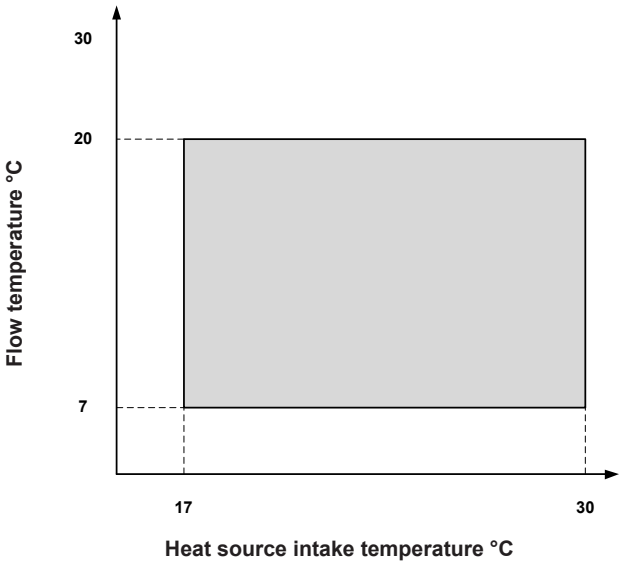


Thermalia® dual H (35-90)



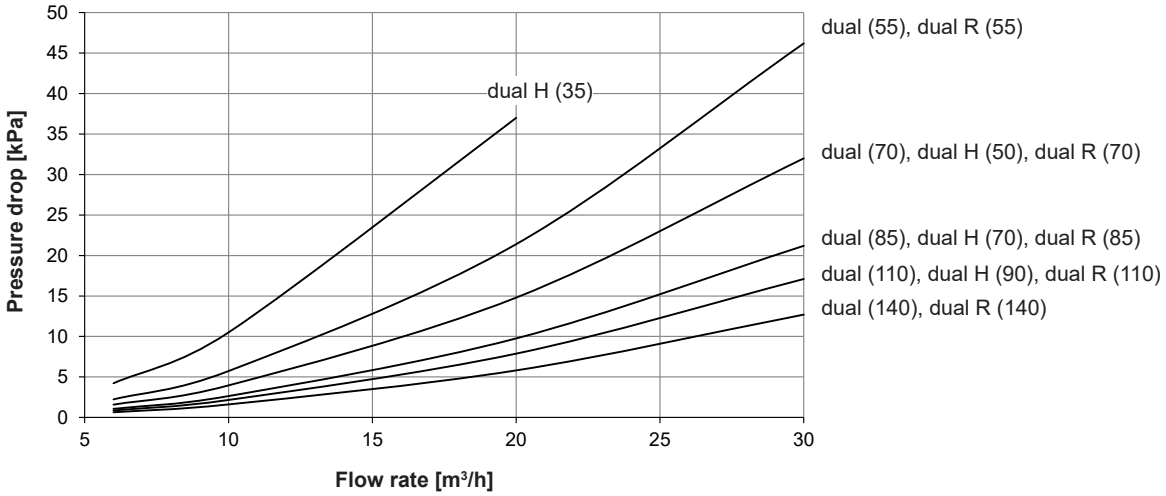
Cooling

Thermalia® dual R (55-140)



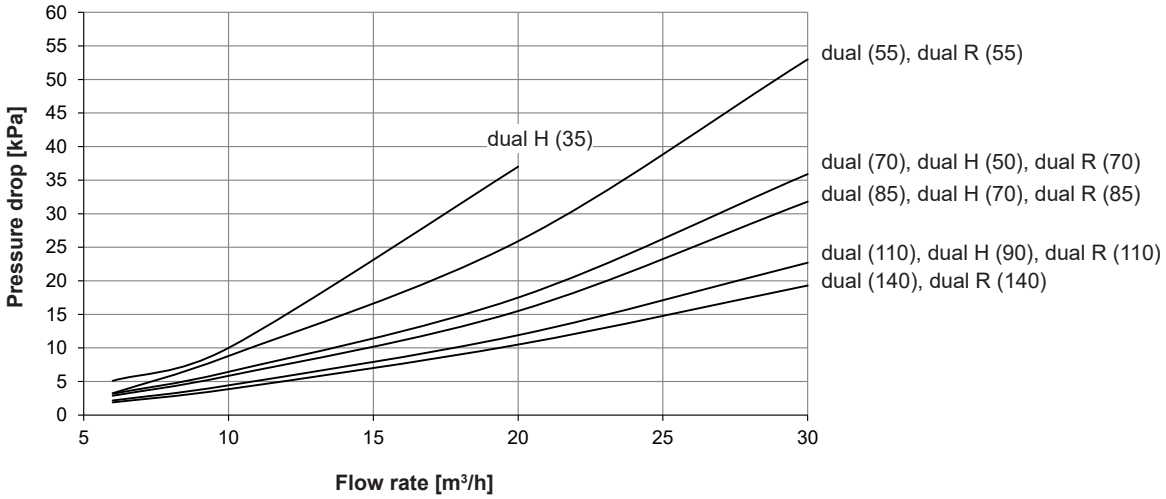
Heating

Pressure drop condenser
with water



Heat source

Pressure drop evaporator
with ethylene glycol 25 %
(antifrogen N)

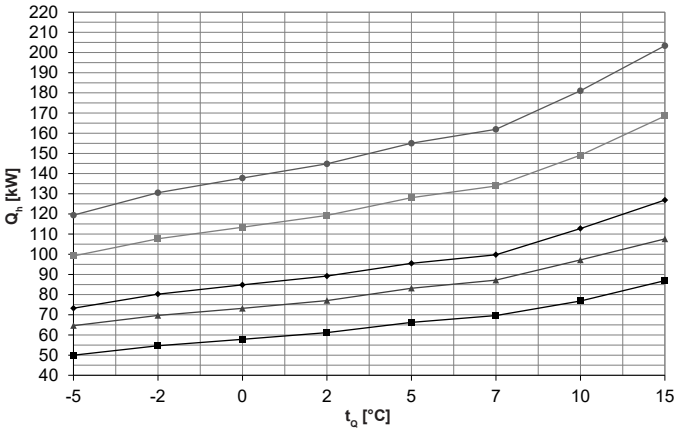


Performance data - heating

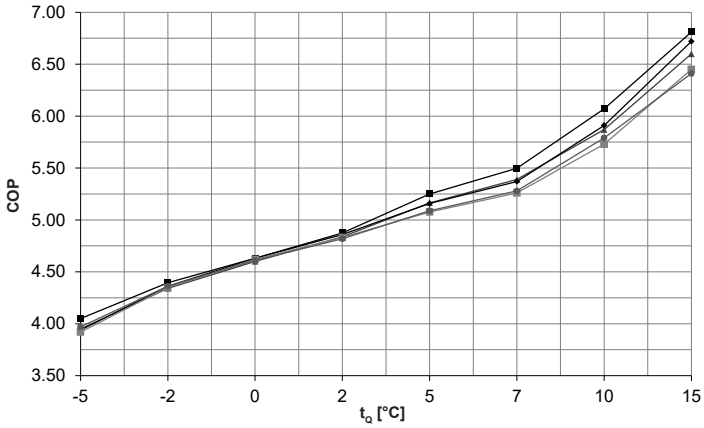
Maximum heat output

Thermalia® dual (55-140), dual R (55-140) with R410A

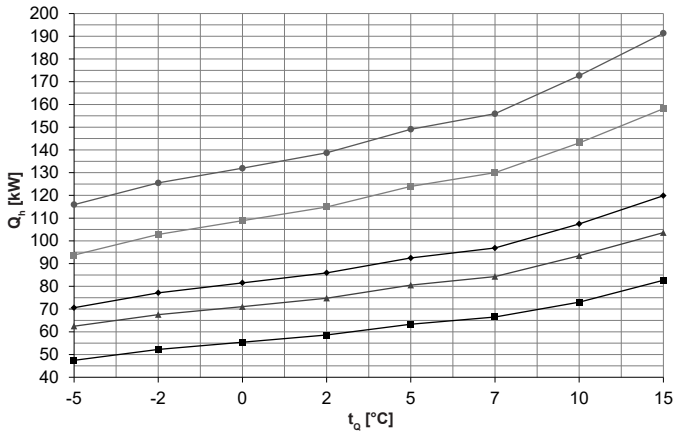
Heat output - t_{VL} 35 °C



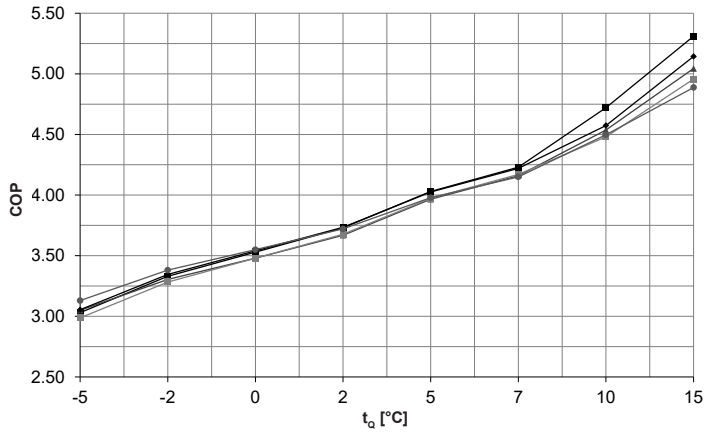
Coefficient of performance - t_{VL} 35 °C



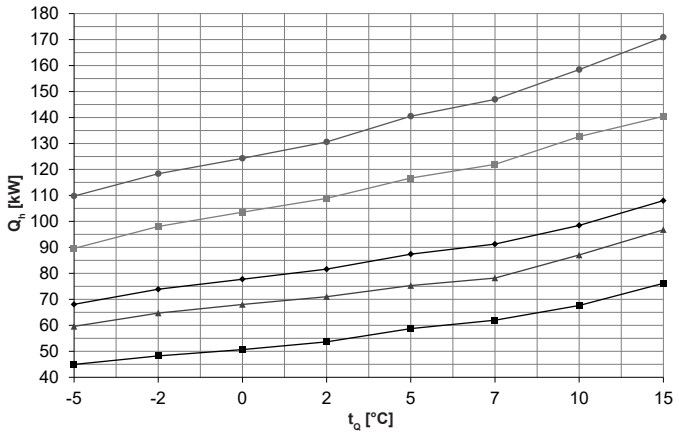
Heat output - t_{VL} 45 °C



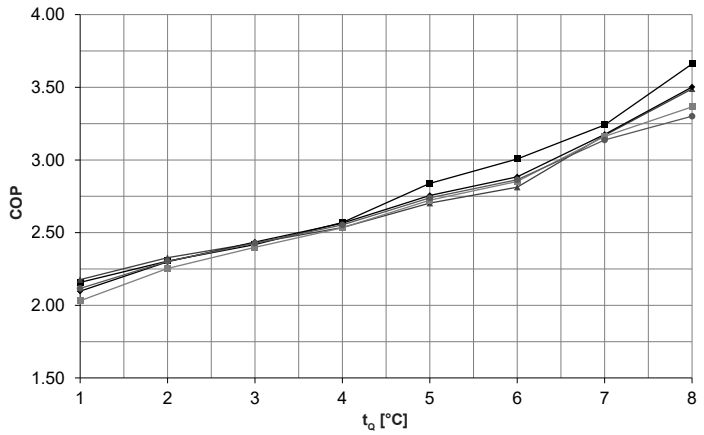
Coefficient of performance - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Coefficient of performance - t_{VL} 62 °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

- Thermalia® dual, dual R (55)
- Thermalia® dual, dual R (70)
- Thermalia® dual, dual R (85)
- Thermalia® dual, dual R (110)
- Thermalia® dual, dual R (140)

Performance data - heating

Thermalia® dual (55-140), dual R (55-140)

Indications acc. to EN 14511

Type			(55), R (55)			(70), R (70)			(85), R (85)			(110), R (110)			(140), R (140)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP
30	Brine	-5	50.6	10.9	4.7	65.6	14.3	4.6	74.0	15.6	4.7	100.1	21.2	4.7	121.5	25.4	4.8
		-2	55.9	10.9	5.1	70.6	13.8	5.1	81.2	15.5	5.2	109.0	20.9	5.2	132.6	25.3	5.2
		0	59.3	11.0	5.4	74.1	13.6	5.5	86.0	15.5	5.6	115.0	20.8	5.5	139.9	25.4	5.5
		2	62.6	11.0	5.7	78.2	13.5	5.8	90.5	15.5	5.8	121.1	20.9	5.8	147.0	25.5	5.8
		5	67.6	11.2	6.1	84.9	13.7	6.2	97.1	15.7	6.2	130.3	21.5	6.1	157.5	26.0	6.1
		7	70.9	11.2	6.3	89.2	13.8	6.5	101.5	15.8	6.4	136.5	21.7	6.3	164.5	26.2	6.3
	Water	10	78.4	11.0	7.1	99.1	14.5	6.8	115.4	16.9	6.8	152.2	23.1	6.6	185.3	27.7	6.7
		15	88.8	11.2	7.9	109.6	14.2	7.7	130.3	16.7	7.8	173.7	23.2	7.5	209.4	28.0	7.5
35	Brine	-5	50.0	12.3	4.1	64.6	16.4	4.0	73.2	18.6	3.9	99.1	25.3	3.9	119.4	30.1	4.0
		-2	54.7	12.4	4.4	69.7	16.1	4.3	80.2	18.4	4.4	107.7	24.8	4.4	130.5	29.9	4.4
		0	57.9	12.5	4.6	73.2	15.9	4.6	84.8	18.3	4.6	113.4	24.6	4.6	137.8	29.9	4.6
		2	61.2	12.6	4.9	77.0	15.9	4.8	89.2	18.4	4.9	119.2	24.7	4.8	144.8	30.0	4.8
		5	66.3	12.6	5.3	83.2	16.1	5.2	95.5	18.5	5.2	128.0	25.2	5.1	155.0	30.5	5.1
		7	69.6	12.7	5.5	87.2	16.2	5.4	99.8	18.6	5.4	133.9	25.4	5.3	161.9	30.7	5.3
	Water	10	76.9	12.7	6.1	97.2	16.6	5.9	112.8	19.1	5.9	149.1	26.0	5.7	181.1	31.3	5.8
		15	86.9	12.8	6.8	107.6	16.3	6.6	126.8	18.9	6.7	168.5	26.1	6.5	203.4	31.7	6.4
40	Brine	-5	48.9	14.0	3.5	63.7	18.4	3.5	72.2	20.9	3.5	96.8	28.4	3.4	117.8	33.6	3.5
		-2	53.5	14.0	3.8	68.8	18.2	3.8	78.9	20.7	3.8	105.6	28.0	3.8	128.1	33.5	3.8
		0	56.6	14.1	4.0	72.2	18.1	4.0	83.4	20.6	4.1	111.4	27.8	4.0	135.0	33.4	4.0
		2	59.8	14.1	4.2	76.0	18.1	4.2	87.7	20.6	4.3	117.3	27.8	4.2	141.9	33.6	4.2
		5	64.8	14.1	4.6	81.9	18.1	4.5	94.1	20.7	4.5	126.1	28.2	4.5	152.2	33.9	4.5
		7	68.1	14.2	4.8	85.7	18.2	4.7	98.3	20.7	4.7	131.9	28.3	4.7	159.0	34.1	4.7
	Water	10	75.0	14.1	5.3	95.3	18.6	5.1	110.1	21.3	5.2	146.1	29.0	5.0	176.9	34.8	5.1
		15	84.8	14.2	6.0	105.6	18.4	5.7	123.4	21.1	5.9	163.3	29.0	5.6	197.4	35.4	5.6
45	Brine	-5	47.5	15.7	3.0	62.5	20.5	3.1	70.6	23.1	3.1	93.7	31.4	3.0	115.9	37.0	3.1
		-2	52.2	15.7	3.3	67.6	20.4	3.3	77.2	23.1	3.4	102.8	31.3	3.3	125.5	37.1	3.4
		0	55.4	15.7	3.5	71.1	20.4	3.5	81.5	23.0	3.5	108.9	31.3	3.5	132.0	37.2	3.6
		2	58.6	15.7	3.7	74.8	20.4	3.7	85.9	23.0	3.7	114.9	31.2	3.7	138.7	37.3	3.7
		5	63.3	15.7	4.0	80.5	20.3	4.0	92.5	23.0	4.0	124.0	31.2	4.0	149.1	37.5	4.0
		7	66.5	15.7	4.2	84.3	20.3	4.2	96.8	22.9	4.2	130.0	31.2	4.2	155.9	37.6	4.2
	Water	10	73.1	15.5	4.7	93.5	20.6	4.5	107.5	23.5	4.6	143.0	31.9	4.5	172.7	38.4	4.5
		15	82.7	15.6	5.3	103.6	20.5	5.0	119.9	23.3	5.1	158.1	31.9	5.0	191.3	39.2	4.9
50	Brine	-5	47.1	17.1	2.8	61.8	22.5	2.8	70.3	26.1	2.7	93.5	35.5	2.6	114.2	41.9	2.7
		-2	51.1	17.2	3.0	66.9	22.5	3.0	76.6	25.9	3.0	102.2	35.0	2.9	123.7	41.6	3.0
		0	53.9	17.2	3.1	70.3	22.6	3.1	80.8	25.8	3.1	107.9	34.8	3.1	130.1	41.5	3.1
		2	57.0	17.2	3.3	73.7	22.6	3.3	84.9	25.7	3.3	113.5	34.7	3.3	136.8	41.6	3.3
		5	62.1	17.1	3.6	78.9	22.6	3.5	91.0	25.7	3.5	121.8	34.8	3.5	146.9	41.8	3.5
		7	65.3	17.1	3.8	82.3	22.5	3.7	95.1	25.7	3.7	127.4	34.9	3.7	153.6	41.9	3.7
	Water	10	71.7	17.2	4.2	91.6	22.6	4.1	104.8	25.7	4.1	140.0	34.9	4.0	168.5	42.0	4.0
		15	80.9	17.2	4.7	101.6	22.7	4.5	116.4	25.5	4.6	152.9	34.8	4.4	185.3	42.9	4.3
55	Brine	-5	46.5	18.6	2.5	62.1	24.2	2.6	70.5	28.3	2.5	92.8	38.5	2.4	113.7	45.5	2.5
		-2	49.9	18.7	2.7	66.8	24.2	2.8	76.6	27.7	2.8	101.7	37.4	2.7	122.0	44.4	2.8
		0	52.5	18.7	2.8	70.0	24.1	2.9	80.6	27.4	2.9	107.4	36.8	2.9	127.8	43.9	2.9
		2	55.5	18.7	3.0	73.2	24.1	3.0	84.4	27.3	3.1	112.8	36.7	3.1	134.2	43.9	3.1
		5	60.7	18.6	3.3	77.9	24.1	3.2	90.1	27.3	3.3	120.5	37.0	3.3	144.5	44.3	3.3
		7	64.0	18.5	3.5	81.1	24.1	3.4	93.9	27.3	3.4	125.7	37.1	3.4	151.2	44.5	3.4
	Water	10	70.2	18.8	3.7	89.7	24.6	3.6	102.2	27.9	3.7	136.9	37.8	3.6	164.3	45.5	3.6
		15	79.0	18.8	4.2	99.6	24.8	4.0	112.9	27.7	4.1	147.7	37.7	3.9	179.3	46.6	3.9
62	Brine	-5	45.0	20.8	2.2	59.6	27.4	2.2	68.1	32.5	2.1	89.6	44.1	2.0	109.8	51.9	2.1
		-2	48.2	20.9	2.3	64.7	27.8	2.3	73.9	32.1	2.3	98.0	43.5	2.3	118.4	51.4	2.3
		0	50.7	20.9	2.4	68.0	28.0	2.4	77.8	31.9	2.4	103.6	43.2	2.4	124.3	51.2	2.4
		2	53.7	20.9	2.6	71.0	28.0	2.5	81.6	31.8	2.6	108.9	43.0	2.5	130.6	51.2	2.6
		5	58.7	20.7	2.8	75.3	27.9	2.7	87.4	31.7	2.8	116.7	42.8	2.7	140.5	51.3	2.7
		7	62.0	20.6	3.0	78.2	27.8	2.8	91.3	31.6	2.9	121.9	42.7	2.9	147.0	51.3	2.9
	Water	10	67.6	20.9	3.2	87.1	27.5	3.2	98.5	31.0	3.2	132.7	42.0	3.2	158.4	50.5	3.1
		15	76.2	20.8	3.7	96.8	27.7	3.5	108.0	30.8	3.5	140.4	41.7	3.4	170.9	51.8	3.3

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

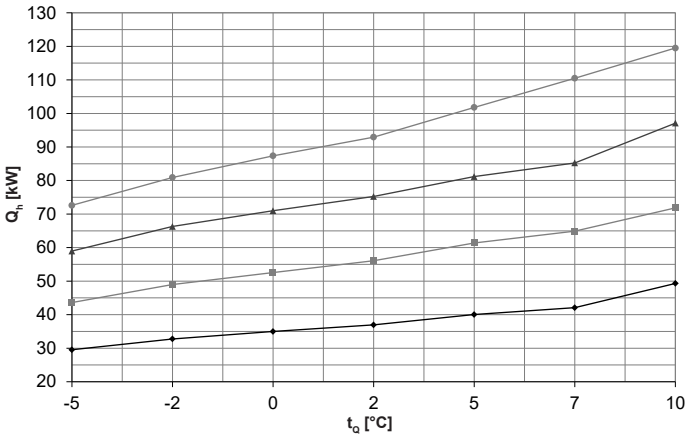
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - heating

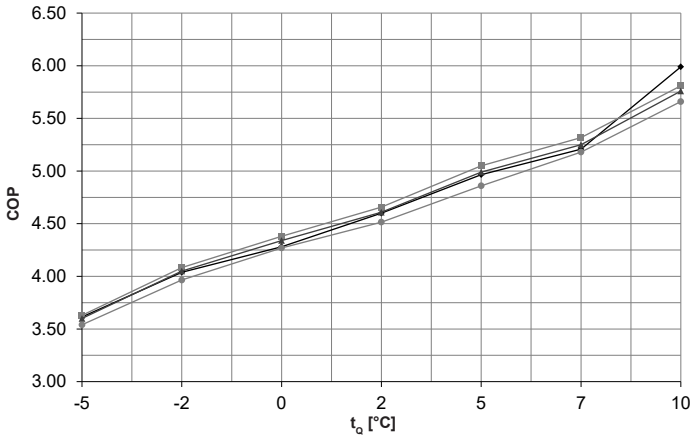
Maximum heat output

Thermalia® dual H (35-90) with R134a

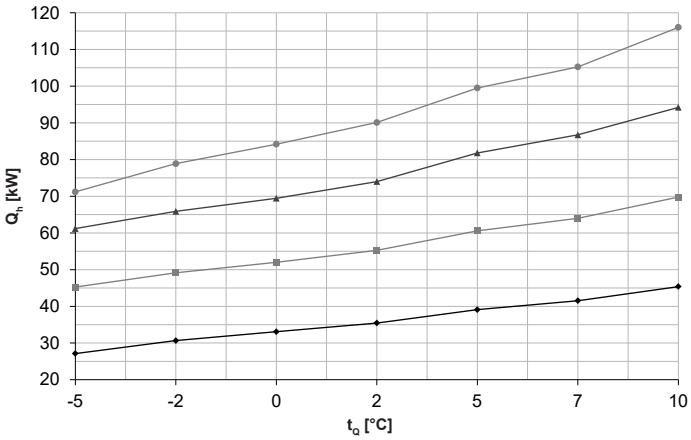
Heat output - t_{VL} 35 °C



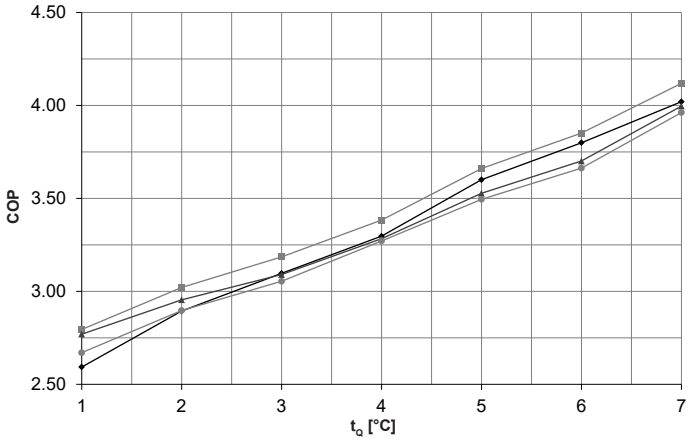
Coefficient of performance - t_{VL} 35 °C



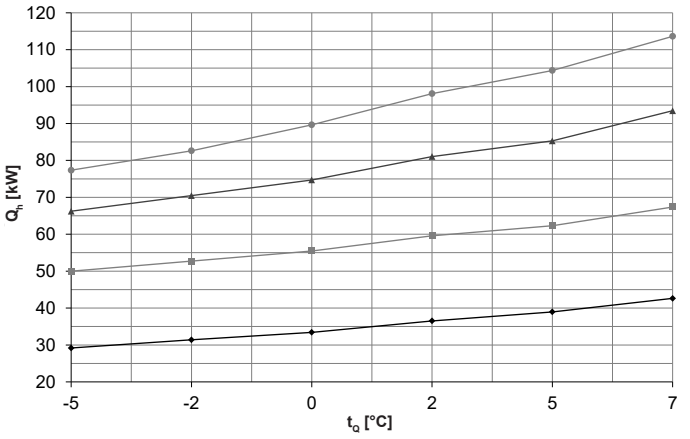
Heat output - t_{VL} 50 °C



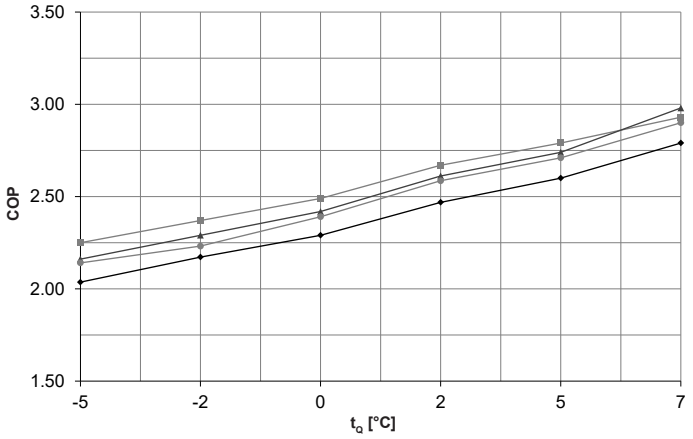
Coefficient of performance - t_{VL} 50 °C



Heat output - t_{VL} 65 °C



Coefficient of performance - t_{VL} 65 °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

- Thermalia® dual H (35)
- Thermalia® dual H (50)
- Thermalia® dual H (70)
- Thermalia® dual H (90)

Performance data - heating

Thermalia® dual H (35-90)

Indications acc. to EN 14511

Type			H (35)			H (50)			H (70)			H (90)		
t_{VL} °C		t_Q °C	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP	Q_h kW	P kW	COP
35	Brine	-5	29.5	8.2	3.6	43.6	12.0	3.6	59.0	16.4	3.6	72.6	20.5	3.5
		-2	32.8	8.1	4.0	49.0	12.0	4.1	66.3	16.4	4.1	80.9	20.4	4.0
		0	35.0	8.1	4.3	52.5	12.0	4.4	71.0	16.4	4.3	87.4	20.3	4.3
		2	37.0	8.0	4.6	56.1	12.0	4.7	75.2	16.3	4.6	92.9	20.6	4.5
		5	40.0	8.1	5.0	61.4	12.2	5.1	81.2	16.3	5.0	101.8	20.9	4.9
		7	42.1	8.1	5.2	64.9	12.2	5.3	85.2	16.2	5.3	110.5	21.3	5.2
	Water	10	49.3	8.2	6.0	71.8	12.4	5.8	97.1	16.9	5.8	119.5	21.1	5.7
40	Brine	-5	28.7	9.0	3.2	44.4	13.2	3.4	60.0	18.0	3.3	71.9	22.4	3.2
		-2	32.1	9.1	3.5	49.1	13.2	3.7	66.1	18.0	3.7	80.2	22.4	3.6
		0	34.5	9.1	3.8	52.4	13.3	4.0	70.2	18.1	3.9	86.1	22.5	3.8
		2	36.7	9.0	4.1	55.8	13.3	4.2	74.6	18.1	4.1	91.7	22.4	4.1
		5	40.1	9.0	4.4	61.0	13.5	4.5	81.4	18.5	4.4	100.4	23.3	4.3
		7	42.4	9.1	4.7	64.5	13.5	4.8	85.9	18.6	4.6	107.2	23.6	4.5
	Water	10	47.5	9.2	5.2	71.2	13.7	5.2	95.8	19.0	5.0	118.1	23.7	5.0
45	Brine	-5	27.8	9.7	2.9	45.1	14.6	3.1	61.0	19.9	3.1	71.4	24.4	2.9
		-2	31.5	9.8	3.2	49.7	14.7	3.4	66.0	19.9	3.3	79.5	24.7	3.2
		0	33.9	9.9	3.4	52.8	14.7	3.6	69.7	19.9	3.5	85.0	24.9	3.4
		2	36.4	9.9	3.7	55.8	14.8	3.8	74.0	20.2	3.7	90.8	25.3	3.6
		5	40.1	10.2	3.9	60.3	14.9	4.0	81.2	20.9	3.9	99.6	25.8	3.9
		7	42.6	10.3	4.1	63.3	15.0	4.2	85.8	21.2	4.0	105.5	26.1	4.0
	Water	10	46.6	10.2	4.6	70.4	15.3	4.6	94.6	21.4	4.4	116.9	26.4	4.4
50	Brine	-5	27.1	10.5	2.6	45.3	16.2	2.8	61.2	22.1	2.8	71.2	26.7	2.7
		-2	30.7	10.6	2.9	49.1	16.3	3.0	65.9	22.3	3.0	78.9	27.2	2.9
		0	33.1	10.7	3.1	52.0	16.3	3.2	69.5	22.5	3.1	84.2	27.6	3.1
		2	35.5	10.8	3.3	55.2	16.3	3.4	74.0	22.5	3.3	90.1	27.5	3.3
		5	39.1	10.9	3.6	60.6	16.5	3.7	81.8	23.2	3.5	99.5	28.5	3.5
		7	41.5	10.9	3.8	64.0	16.6	3.9	86.7	23.4	3.7	105.3	28.7	3.7
	Water	10	45.4	11.3	4.0	69.8	16.9	4.1	94.2	23.6	4.0	116.0	29.3	4.0
55	Brine	-5	26.4	11.5	2.3	45.1	18.0	2.5	61.0	24.5	2.5	71.2	29.1	2.5
		-2	29.9	11.7	2.6	48.6	18.0	2.7	65.8	25.0	2.6	78.3	30.0	2.6
		0	32.2	11.8	2.7	51.3	18.1	2.8	69.5	25.3	2.8	83.5	30.5	2.7
		2	34.5	11.9	2.9	54.8	18.2	3.0	74.2	25.5	2.9	89.7	30.9	2.9
		5	38.1	12.0	3.2	60.8	18.3	3.3	82.2	25.6	3.2	99.9	31.3	3.2
		7	40.4	12.1	3.4	64.6	18.4	3.5	87.3	25.7	3.4	106.5	31.5	3.4
	Water	10	44.8	12.5	3.6	69.0	18.8	3.7	94.1	25.9	3.6	115.4	32.2	3.6
65	Brine	-5	-	-	-	-	-	-	-	-	-	-	-	-
		-2	29.2	14.3	2.0	50.0	22.2	2.3	66.2	30.6	2.2	77.3	36.1	2.1
		0	31.4	14.5	2.2	52.7	22.2	2.4	70.5	30.8	2.3	82.6	37.0	2.2
		2	33.4	14.6	2.3	55.5	22.3	2.5	74.7	30.9	2.4	89.6	37.5	2.4
		5	36.5	14.8	2.5	59.6	22.3	2.7	81.0	31.0	2.6	98.1	37.9	2.6
		7	39.0	15.0	2.6	62.3	22.3	2.8	85.3	31.1	2.7	104.4	38.5	2.7
	Water	10	42.6	15.3	2.8	67.4	23.0	2.9	93.5	31.4	3.0	113.6	39.2	2.9
67	Water	13	46.3	15.0	3.1	73.2	22.5	3.2	100.5	31.3	3.2	122.9	38.5	3.2
		15	48.4	4.9	3.2	76.5	22.4	3.4	105.0	31.2	3.4	128.9	38.5	3.3

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

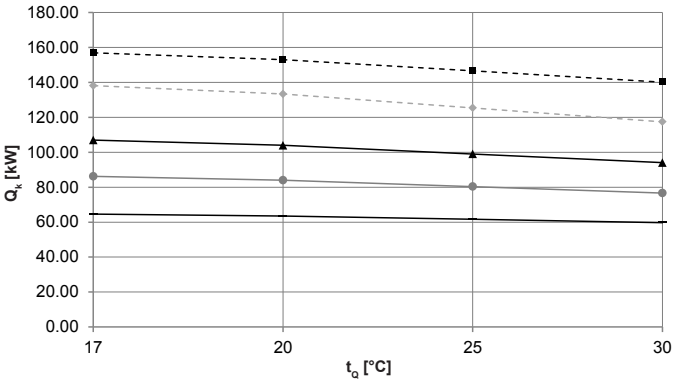
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

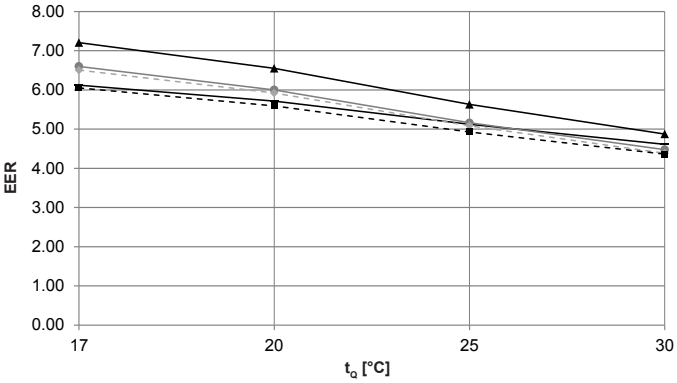
Maximum cooling capacity

Thermalia® dual R (55-140) with R410A

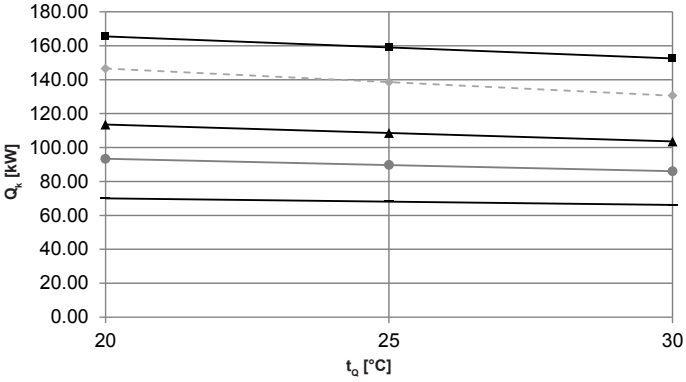
Cooling capacity - t_{VL} 9 °C



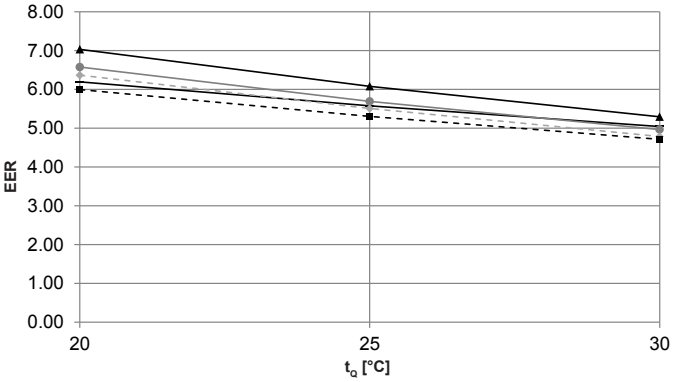
Energy efficiency ratio - t_{VL} 9 °C



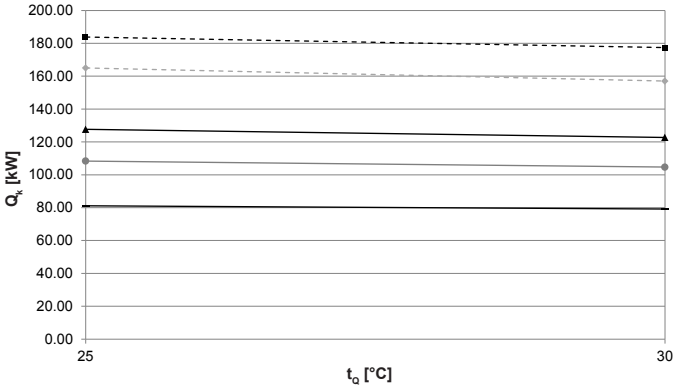
Cooling capacity - t_{VL} 12 °C



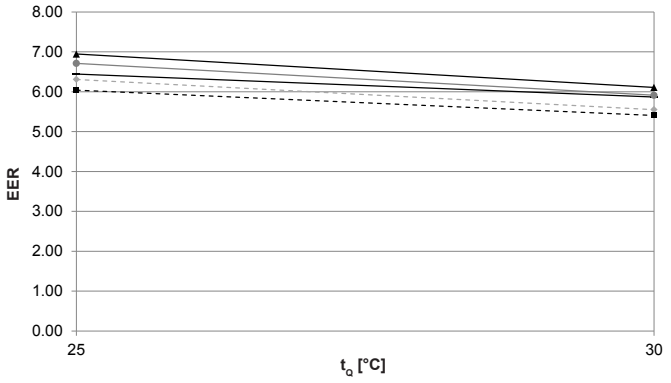
Energy efficiency ratio - t_{VL} 12 °C



Cooling capacity - t_{VL} 18 °C



Energy efficiency ratio - t_{VL} 18 °C



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

- Thermalia® dual R (55)
- Thermalia® dual R (70)
- Thermalia® dual R (85)
- Thermalia® dual R (110)
- Thermalia® dual R (140)

Performance data – cooling

Thermalia® dual R (55-140)
Data according to EN 14511

Type	Heat source		R (55)			R (70)			R (85)			R (110)			R (140)		
t_{VL} °C	Medium t1	t_Q °C	Q_k kW	P kW	EER	Q_k kW	P kW	EER	Q_k kW	P kW	EER	Q_k kW	P kW	EER	Q_k kW	P kW	EER
9	Brine (Sole)	17	64.7	10.6	6.1	86.2	13.1	6.6	107.0	14.8	7.2	138.1	21.2	6.5	156.9	25.9	6.1
		20	63.5	11.1	5.7	84.0	14.0	6.0	104.0	15.9	6.6	133.3	22.5	5.9	153.0	27.4	5.6
		25	61.6	12.0	5.1	80.3	15.6	5.2	99.0	17.6	5.6	125.4	24.7	5.1	146.6	29.7	4.9
		30	59.7	12.9	4.6	76.7	17.1	4.5	94.0	19.3	4.9	117.4	26.8	4.4	140.1	32.1	4.4
12	Brine (Sole)	20	70.0	11.3	6.2	93.3	14.2	6.6	113.6	16.1	7.0	146.5	23.0	6.4	165.5	27.6	6.0
		25	68.1	12.2	5.6	89.7	15.8	5.7	108.6	17.9	6.1	138.6	25.2	5.5	159.0	30.0	5.3
		30	66.2	13.1	5.0	86.0	17.3	5.0	103.6	19.6	5.3	130.6	27.3	4.8	152.5	32.4	4.7
15	Brine (Sole)	25	74.6	12.4	6.0	99.0	16.0	6.2	118.2	18.1	6.5	151.8	25.7	5.9	171.4	30.2	5.7
		30	72.7	13.3	5.5	95.3	17.5	5.4	113.2	19.8	5.7	143.8	27.8	5.2	165.0	32.6	5.1
18	Brine (Sole)	25	81.1	12.6	6.4	108.3	16.2	6.7	127.7	18.4	7.0	165.0	26.2	6.3	183.9	30.4	6.0
		30	79.2	13.5	5.9	104.7	17.7	5.9	122.7	20.1	6.1	157.0	28.3	5.6	177.4	32.8	5.4

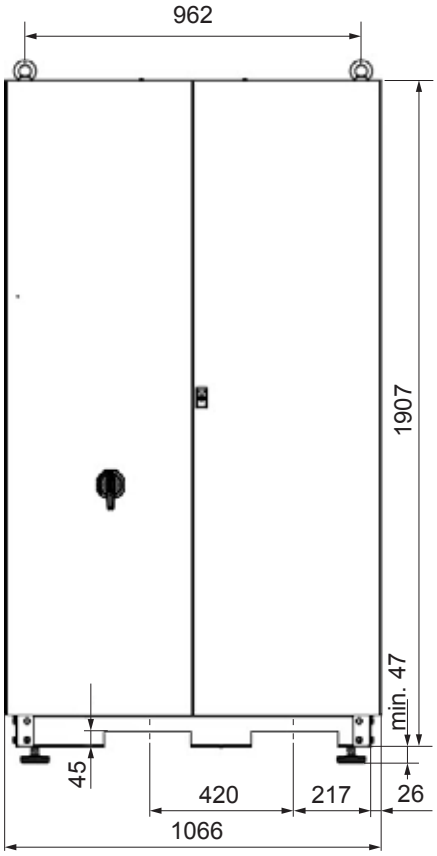
t_{VL} = cooling water flow temperature (°C)
t_Q = source temperature (°C)
Q_k = cooling capacity (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
EER = Energy Efficiency Ratio for the overall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

Observe daily power interruptions!
see “Engineering heat pumps general”

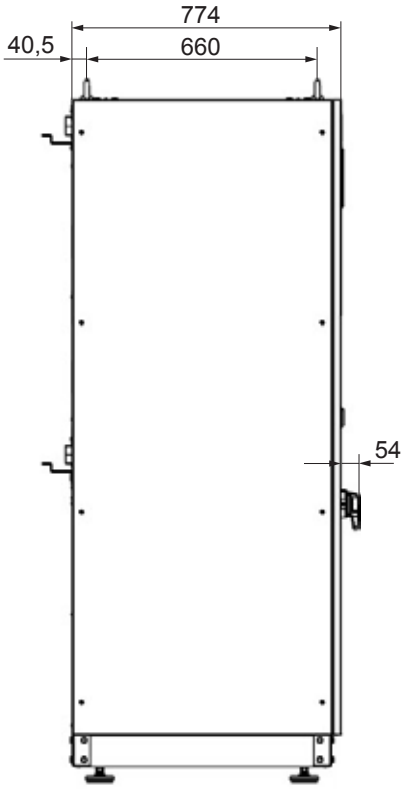
Thermalia® dual (55-85), dual H (35), dual R (55-85)

(Dimensions in mm)

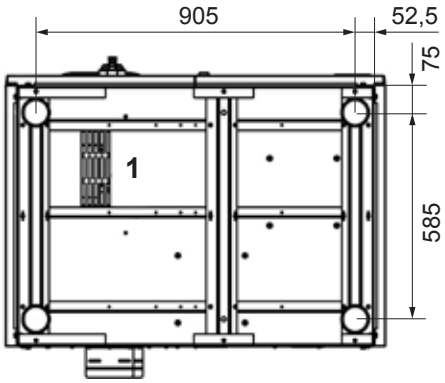
Front view



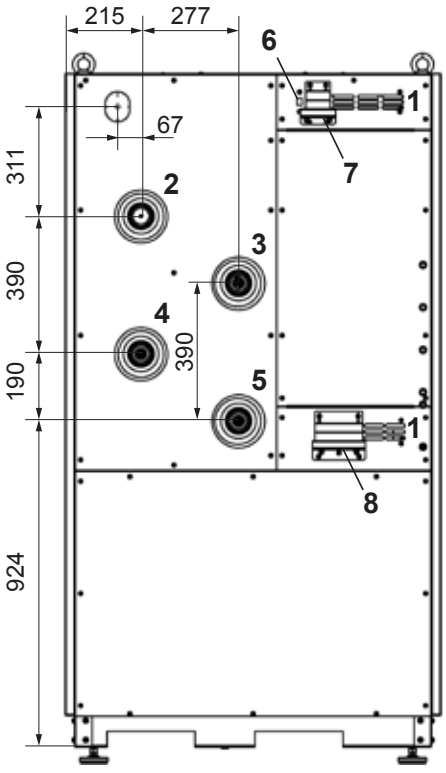
Side view



View from below



Rear view

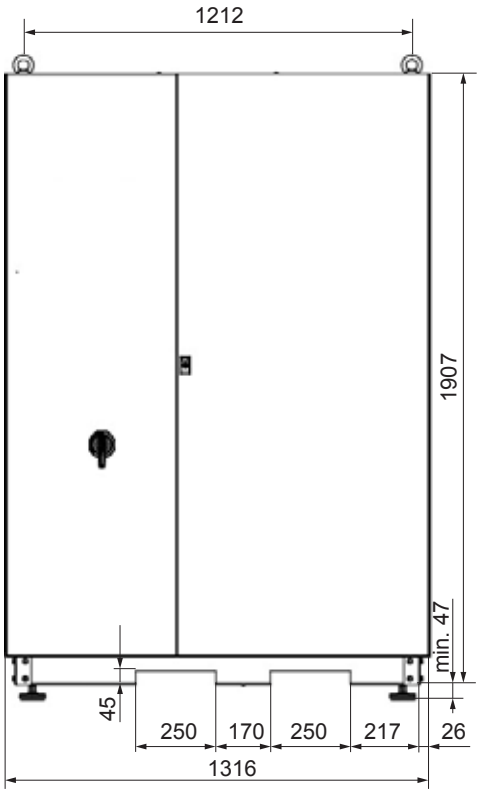


1 Vent opening
2 Flow heating or storage tank Rp 2″
3 Brine or ground water inlet Rp 2″
4 Return heating or storage tank Rp 2″
5 Brine or ground water outlet Rp 2″
6 LAN interface
7 Cable feedthrough for sensors and actuators
8 Cable feedthrough for the mains supply and connection to the main circuit

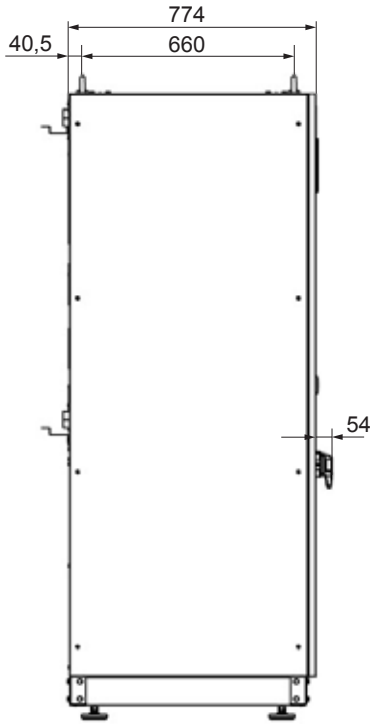
Adjustable feet with M12 thread

Thermalia® dual (110-140), dual H (50-90), dual R (110-140)
(Dimensions in mm)

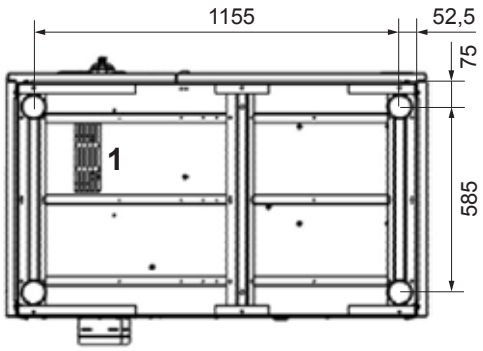
Front view



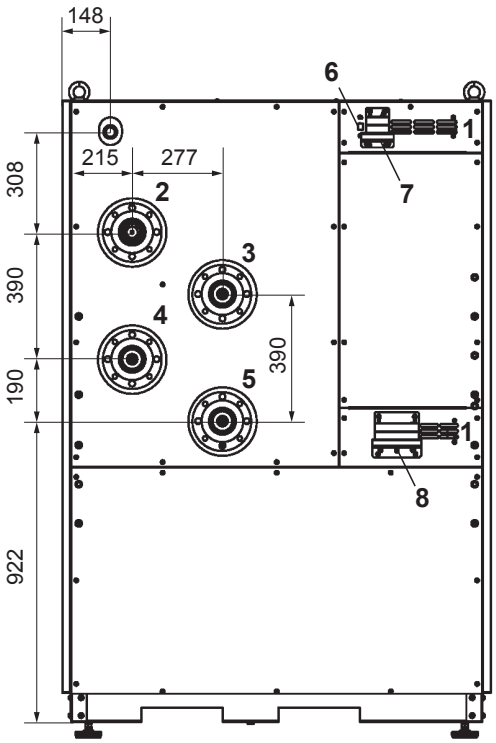
Side view



View from below



Rear view



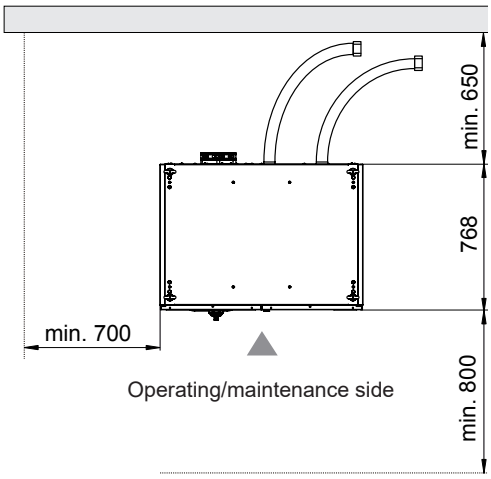
1 Vent opening
2 Flow heating or storage tank
Thermalia® dual H (50,70) Rp 2″
Thermalia® dual, dual R (110,140), dual H (90) flange DN 80/PN 6
3 Brine or ground water inlet
Thermalia® dual H (50,70) Rp 2″
Thermalia® dual, dual R (110,140), dual H (90) flange DN 80/PN 6
4 Return heating or storage tank
Thermalia® dual H (50,70) Rp 2″
Thermalia® dual, dual R (110,140), dual H (90) flange DN 80/PN 6
5 Brine or ground water outlet
Thermalia® dual H (50,70) Rp 2″
Thermalia® dual, dual R (110,140), dual H (90) flange DN 80/PN 6
6 LAN interface
7 Cable feedthrough for sensors and actuators
8 Cable feedthrough
for the mains supply and connection to the main circuit

Adjustable feet with M12 thread

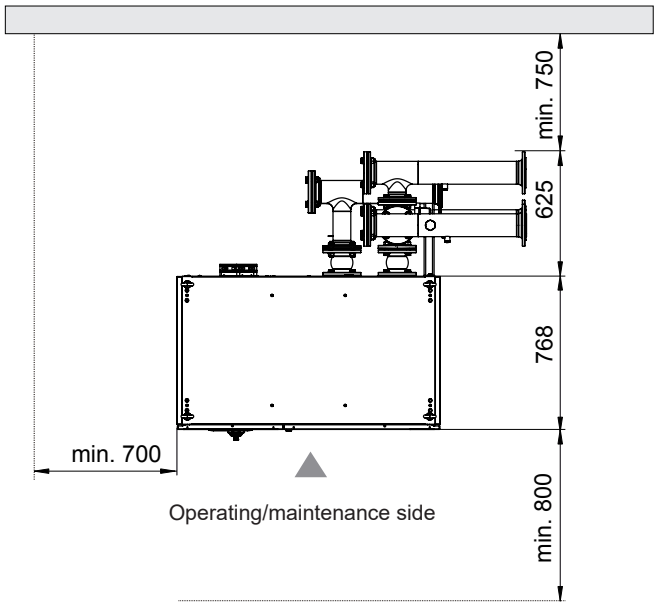
Space requirement

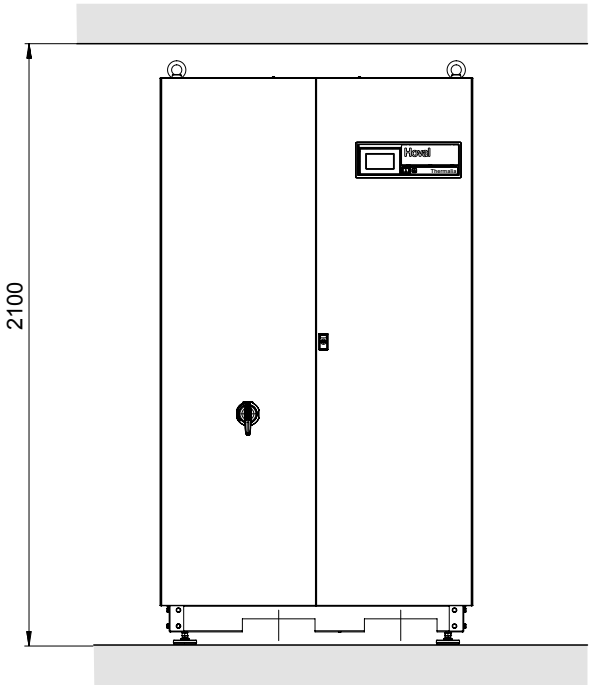
Required wall clearance for operation and maintenance
(Dimensions in mm)

Thermalia® dual (55-85), dual H (35-70), dual R (55-85)



Thermalia® dual (110-140), dual H (90), dual R (110-140)





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

Fan convector DXA ECM

- **Fan convector for heating and cooling for wall installation. Spreads warmth or cold in conjunction with a heat pump**
- The design of the fan convector DXA ECM has been kept clear and linear. Whisper-quiet due to the use of a highly efficient EC motor as well as a balanced tangential fan.
- With remote control and electrically adjustable air outlet
- 2-line unit with integrated 2-way valve
- Sophisticated casing with gloss finish made from high-quality ABS plastic
- Casing colour white (RAL 9003)
- Air outlet louvres in casing colour white (RAL 9003)
- Air distribution to the right or left by means of air guide louvres/intermediate louvres that can be continuously pivoted by 30° in both directions (only manually adjustable)
- ErP-compliant (Directive 327/2011)
- Filter:
  - The filter unit is mounted on the top of the unit and keeps out coarse suspended particles.
  - Can be easily dismantled and washed down without tools
- Heat exchanger coil:
  - 2-pipe, 2-row coil made of copper tubes with aluminium louvres, which give the DXA ECM wall-mounted unit a particularly low weight and are intended for water operation.
  - Not suitable for environments in which corrosion of aluminium can occur.
- Condensate drip tray:
  - The plastic condensate drip tray is already integrated in the fan convector.
  - Connection outside diameter 16 mm
- EC electric motor:
  - EC motor with infinitely variable speed adjustment (0-10 V), 230 V/50 Hz
  - Particularly low-noise and maintenance-free, because self-lubricating
  - The use of the modern EC motors enables energy savings of up to 70 % compared to conventional single-phase AC motors.
- Fan unit:
  - Balanced tangential fan made of plastic with optimised concave louvres
  - With optimised flow so that it conveys the maximum air volume with the minimum energy consumption
- Connection:
  - Water connection left 1/2″
  - Electrical right

Fan convector DXA ECM		Heating	Cooling
Total output	kW	4.6	3.8
Water flow rate	l/h	400	662
Water pressure drop	kPa	13	41

- Packaging concept and installation:
  - Ingenious packaging concept, space-saving and disposable
  - On the lid of the packing there is a drilling template for quick and easy installation.
- Operating conditions:
  - Max. water temperature: 70 °C
  - Min. water temperature: 6 °C
  - Max. operating pressure: 10 bar
- Dimensions (H x W x D):
  322 x 1185 x 212 mm
- Weight: 14 kg

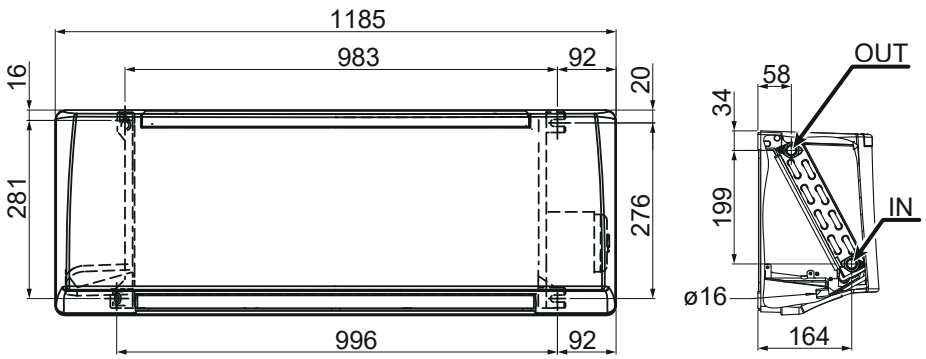
Fan convector

		Part No.
	**Fan convector DXA ECM (4)** Fan convector for heating and cooling for wall installation. Spreads warmth or cold if installed in a heating system with heat pump. With remote control and electrically adjustable air outlet. 2-wire device with integrated 2-way valve Housing colour: white (RAL 9003) Highly efficient EC motor with infinitely variable speed adjustment (0-10 V), 230 V/50 Hz, particularly low-noise Max. sound power level: 57 dB(A) Min. sound power level: 43 dB(A) Dimensions (H x W x D): 322 x 1185 x 212 mm Cooling: - Total cooling capacity: 3.8 kW at 7 °C/12 °C - Water flow: 662 l/h - Water pressure drop: 41 kPa - Total cooling capacity: 2.2 kW at 12 °C/17 °C - Water flow: 378 l/h Heating: - Total heating capacity: 4.6 kW at 50 °C/40 °C - Water flow: 400 l/h - Water pressure drop: 13 kPa Weight: 14 kg	6053 303
	**Condensate pump DXA ECM** for fan convector DXA ECM (4) with three-stage liquid level switch: off-condensate pump, on-alarm Mounted on vibration-damping mounting plate. Quietest condensate pump on the market Sound pressure level at 1 m distance: 25.1 dB(A) With a delivery height of 6 m, the pump achieves a flow rate of 2.5 l/h. Max. flow rate: 10 l/h Max. suction head: 2 m Max. recommended delivery head: 6 m Power consumption: 18 W Operating voltage: 230 V/50 Hz Type of protection: IP20	2077 574
	**Remote control DXA ECM** for fan convector DXA ECM (4) 3 speed levels additional automatic speed On/Off button Manual and automatic change-over Additional mode selection, only ventilation Integrated timer, day program With DXA wall-mounted appliances, adjusting air outlet by remote control is possible Type of protection: IP20 Consisting of: - 1 remote control DXA ECM - 1 wall bracket - 2 LR03 (AAA) batteries	2077 575

Notice:
The remote control is included in the scope of delivery of the fan convector DXA ECM (4).

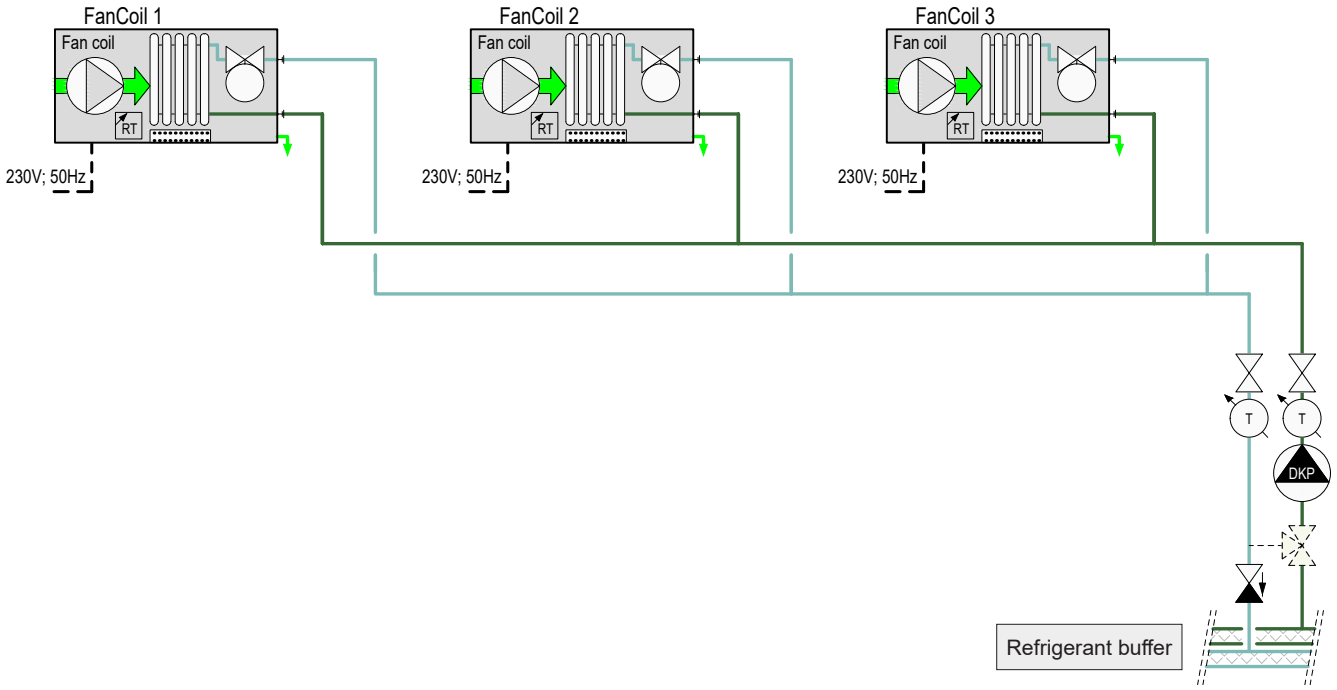
Fan convector DXA ECM (4)

(Dimensions in mm)



Example

System example for 3 fan coils maximum.
Systems with more than 3 fan coils must be clarified and planned depending on the individual plant.
General rule: The insulation used for a combined heating and cooling system must be configured so there cannot be any moisture penetration in cooling mode!
If there are large length differences of the connection line towards the respective fan coils, measures for initial adjustment of the system (line balancing valves/combination valves) must be taken!



Requirements and directives

The following requirements and directives must be complied with:

- Technical information and assembly instructions from Hoval
- Hydraulic regulations and those pertaining to instrumentation and control
- Building regulations
- Fire protection regulations
- Regulations of the local power station
- VDI 4640: Thermal use of the underground
- DIN EN 1736: Refrigerating systems and heat pumps
- DIN EN 378: Refrigerating systems and heat pumps - Safety and environmental requirements
- DIN EN 13313: Refrigerating systems and heat pumps - Competence of personnel
- VDI Directive 2035: Protection against corrosion and boiler scale in heating and domestic hot water systems.
- EN 12828: Heating systems in buildings - Design of hot water heating systems
- EN 12831: Heating systems in buildings - Method for calculation of the design heat load
- EN 15450: Heating systems in buildings - Design of heat pump heating systems

Switzerland:

Environment

- Chemical risk reduction ordinance (CRRV), Appendix 2.10 ff
- Instructions for using heat from water and ground (Buwal)
- Instructions for using heat with closed geothermal probes (Buwal)
- Noise abatement regulations (LSV)
- SN 253 120 (refrigerant definitions)
- Cantonal and local regulations
- SIA 384/1: Heating systems in buildings

Electrical connection

- VSE recommendations for connecting heat pump systems for heating and domestic water heating to the network of electricity companies (2.29d, September 1983)
- Regulations of the local power station
- Do not attach any rigid connections (e.g. cable duct) to the heat pump housing

Planning and design

- Cantonal and local fire prevention authority regulations as well as state-specific regulations
- SWKI directive 92-1 hydraulic circuit of heat pump heating systems
- FWS and GKS regulations and codes of practice
- SWKI HE301-01 guidelines “Safety engineering installations for heating systems”
- Bivalent systems: special engineering guidelines for the corresponding supplementary heat generator must be observed
- SIA 384/6 Geothermal probes

Austria:

Environment

- ÖWAV code of practice 207: Thermal use of underground water and the underground – heating and cooling
- ÖNORM S 5021: Basic acoustical principles for town, regional and physical planning
- ÖAL Directive no. 3: Assessment of noise emissions in the neighbouring area

Electrical connection

- Country-specific and regional regulations and laws, in particular ÖVE directives

Planning and design

- OIB Directive no. 4: Safety in use and barrier-free access
- ÖNORM B3417: Safety equipment for roofs
- ÖNORM H 5151-1: Design of hot water central heating systems with or without water heating
- ÖNORM H 5195-1 and -2: Heat transfer media for building services systems
- ÖNORM M 7755: Heat pump heating systems

Germany:

Environment

- DIN 8901: Refrigerating systems and heat pumps - Protection of soil, ground and surface water
- TA-Lärm: Requirements on the installation location

Electrical connection

- VDE directives
- Technical connection condition (TAB 2019) for connecting to the low voltage grid
- DIN 8947: Heat pumps; heat pump units with electric driven compressors for heating of water

Planning and design

- Building Energy Act GEG
- Drinking Water Ordinance (TrinkwV)
- DVGW worksheets W 551 and W 553
- DIN EN 15450: Heating systems in buildings - Design of heat pump heating systems
- VDI 4640
- VDI 4650

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

A buffer storage tank is mandatory for Hoval air/water heat pumps.

A buffer storage tank can be dispensed with if a direct heating or cooling circuit with storage capacity is involved, and there is always a constant flow rate (⅔ must be unblockable).

For Hoval heat pumps, the following minimum sizes of the buffer storage tank (EnerVal) must be observed. The minimum running times of the heat pumps are taken into account.
For air/water heat pumps, the energy required for defrosting the heat pump is included.

The volumes for power company off-periods shall be added on a project-by-project basis in accordance with local regulations.

Minimum sizes of buffer storage tank

	EnerVal type
UltraSource® B comfort C (8)	**100**
UltraSource® B compact C (8/200)	**100**
UltraSource® B comfort C (11)	**100**
UltraSource® B compact C (11/200)	**100**
UltraSource® B comfort C (17)	**300**
Belaria® pro comfort (8)	**100**
Belaria® pro comfort (13)	**200**
Belaria® pro comfort (15)	**300**
Belaria® pro (24)	**500**
Belaria® comfort ICM (8)	**100**
Belaria® comfort ICM (13)	**200**
Belaria® twin I/IR (20)	**500**
Belaria® twin I/IR (25)	**500**
Belaria® twin I/IR (30)	**800**
Belaria® twin A / AR (32)	**800**
Belaria® dual AR (60)	**1000**
Daikin Altherma (14)	**100**
Daikin Altherma (18)	**100**
UltraSource® T comfort (8)	**100**
UltraSource® T compact (8/200)	**100**
UltraSource® T comfort (13)	**100**
UltraSource® T compact (13/200)	**100**
UltraSource® T comfort (17)	**200**

	EnerVal type
Thermalia® comfort (8)	**300**
Thermalia® comfort (10)	**500**
Thermalia® comfort (13)	**500**
Thermalia® comfort (17)	**800**
Thermalia® comfort H (7)	**300**
Thermalia® comfort H (13)	**500**
Thermalia® twin (20)	**500**
Thermalia® twin (26)	**500**
Thermalia® twin (36)	**800**
Thermalia® twin (42)	**1000**
Thermalia® twin H (13)	**300**
Thermalia® twin H (19)	**300**
Thermalia® twin H (22)	**500**
Thermalia® dual (55)	**1500**
Thermalia® dual (70)	**1500**
Thermalia® dual (85)	**2000**
Thermalia® dual (110)	**1500 + 1000**
Thermalia® dual (140)	**1500 + 1500**
Thermalia® dual H (35)	**800**
Thermalia® dual H (50)	**1000**
Thermalia® dual H (70)	**1500**
Thermalia® dual H (90)	**2000**
Thermalia® dual R (55)	**1500**
Thermalia® dual R (70)	**1500**
Thermalia® dual R (85)	**2000**
Thermalia® dual R (110)	**1500 + 1000**
Thermalia® dual R (140)	**1500 + 1500**

Off-periods by power companies

If the power supply for the heat pump is temporarily shut down by the power company (for example due to special tariffs), this has to be taken into account in the design of the heat pump. The daily heat quantity must then be produced when electricity is available. The heat pump must be designed for the maximum off-period in accordance with the energy supply contract.
With radiator heating systems, the loss of radiant heat if the electricity is switched off by the energy company is seen as a nuisance, even though the room temperature may not in fact drop significantly. This must be taken into consideration in the design process. A larger buffer storage tank can only bring a limited improvement as with a heat pump, the temperature elevation is kept to a minimum for a better COP.

The volumes for power company off-periods shall be added to the minimum sizes of the buffer storage tanks on a project-by-project basis in accordance with local regulations.

Set-up

In the case of floating screed or underlay, a recess should be cut in the screed and the impact sound insulation around the heat pump.

- The installation location must be selected in accordance with the valid requirements and directives. Rooms with high air humidity, for example laundry rooms, etc. are not suitable installation locations (dewpoint <10 °C)
- The heat pumps installed inside can be mounted on the floor in the boiler room
- The installation location must be free from dust or other foreign matter which could lead to contamination
- Access for the purpose of operation and maintenance must be ensured
- Penetrations and openings in the masonry must be created proficiently (cold bridges, etc. on the outside wall must be avoided at all costs)
- Concrete shafts and light wells by means of which the air is drawn in or blown out must be provided with drainage
- If the ambient temperature of the heat pump is less than 10 °C, it must be equipped with a crankcase heater for each compressor. This applies to heat pumps whether they are set up indoors or outdoors

Indoors

- **Where possible, the installation location should be outside noise-sensitive areas of the building and equipped with a sound-absorbing door**
- Access for the purpose of operation and maintenance must be ensured
- The installation room must be frost-free
- The space around the indoor unit allows for adequate air circulation
- If water is discharged through the safety valve, precautions must be taken to ensure that this water is drained away
- The indoor unit is not allowed to be installed where there could be a potentially explosive atmosphere
- The heat pump must not be installed in a room that is also used as a workplace or workshop. If construction work which generates a lot of dust is carried out in the installation room of the heat pump, the unit must be switched off and covered
- If the noise level is measured under the actual installation conditions, this will be higher than specified in the unit specification. This is because of reflected noise from the surroundings
- Take precautions so that no damage can be caused by leaking water if there is a leak at the installation location and in the vicinity
- The floor must withstand the weight of the indoor unit. It must be level so that no vibration and noise is created and the unit stands securely
- Do not place objects on the unit
- Do not climb onto, sit on or stand on the unit
- Make sure that adequate precautions are or will be taken according to the particular local and national regulations in the event that there is a leak in the refrigerant circuit

It is imperative that a system water protection filter is installed in the heating return upstream from the heat pump.

Outdoors

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

- The subsoil in the installation location must be sufficiently stable to bear the weight of the unit and its vibration in operation
- The location must have adequate space for installation, maintenance and cleaning of the unit (see “Dimensions/Space requirements”)
- As condensate flows out of the outdoor unit, a gravel bed to absorb the condensate must be installed under it. Do not place anything under the outdoor unit that is sensitive to moisture
- Due to the sound emissions, the installation location should not be beneath living-room or bedroom windows and be far enough away from neighbouring buildings (perform calculation)
- The selected location should be such that the air blown out by the unit does not bother occupants of the building or neighbours
- No parts and systems at risk of frost damage are allowed to be on the blow-out side
- It is essential to avoid air short-circuiting. The space necessary for intake and outlet must always be provided (see “Space required”)
- The installation location must be selected so that the air intake and outlet are not blocked or obstructed by snow, leaves, etc.
- Installation in wall niches is not recommended (air short circuit, sound echo)
- Several units must not be installed directly one above the other
- Install the units, the mains cables and the branch wiring at least 3 m away from TV sets and radios. This should prevent interference with picture and sound
- The intake air must be completely free of aggressive substances such as ammonia, sulphur, chlorine etc
- Install the outdoor unit so that the intake side faces the wall and is not directly exposed to the wind
- Never install the outdoor unit in a place where the intake side is directly exposed to the wind
- The outdoor unit must be protected from heavy snowfall
- Install the unit at sufficient height above the ground to ensure that the unit is not covered by snow and freezing condensate cannot impair operation (see separate base plans)

Sound emissions

Indoor installation

The effective sound pressure level in the installation room depends on various factors such as room size, absorption capacity, reflection, free sound propagation, etc. For this reason, it is important to ensure that where possible, the boiler room is outside noise-sensitive areas of the building and equipped with a sound-absorbing door.
If air/water heat pumps are set up indoors, the intake and exhaust air openings or the installation location must be selected so that the sound emissions are not perceived as a disruptive. The openings in the masonry for intake and exhaust air or the installation location must be made in the less frequented area of the building (not below or adjacent to living rooms and bedrooms).
Air ducts made of concrete have unfavourable acoustic properties and often magnify noise emissions. It is therefore advisable to equip the air ducts with a sound-absorbing, weatherproof lining or with sound attenuation splitters.

Outdoor installation

When air/water heat pumps are set up outdoors, optimum planning of the installation location is particularly important, since the noise not only affects the building in question but also often adjacent buildings or properties. The installation location must be selected so that there are no living rooms and bedrooms in the noise emission area. In many cases, selecting the set-up location on the “noisy side” facing the road or street has proven to be ideal.
When it comes to noise emissions, local conditions and individual noise sensitivity play a significant role, which means it is recommended for a specialist (acoustic engineer) to be consulted with regard to finding a solution. No rigid connections (e.g. cable ducts) are allowed to be attached to heat pumps, in order to avoid solid-borne noise.

Design of the heat source

An earthbound heat source (flat collector, depth probe) must be designed for the total energy requirement. The total energy requirement is the sum of the energy requirements for room heating, water heating and, where applicable, special applications.

Hot water supply

If the domestic hot water is heated using the heating heat pump, this must be taken into account when designing the heat pump.
One and two-family home:
0.25 kW per person needs to be added to the heat output. This corresponds to a domestic hot water requirement of about 50 litres at 45 °C per day.

Multi-family home:
In the multi-family home, the design is carried out according to DIN EN 15450 taking account of the hygiene requirements as stated in the Drinking Water Ordinance as well as DVGW worksheets W 551 and W 553. Accordingly, it is first necessary to calculate the maximum domestic hot water requirement and the consumption behaviour. As a rule of thumb, a daily average domestic hot water requirement of 1.45 kWh per person can be assumed. At a storage temperature of 60 °C, this corresponds to a water quantity of 25 l per person.
In the case of increased domestic hot water requirement (large tubs, monsoon showers, etc.) the required bulk output and the daily domestic hot water requirement must be calculated and taken into consideration when dimensioning the heat pump or heat source.
Ideally, calorifiers with large inlying plain tube heat exchangers (CombiVal ESR and ESSR) are used.

The maximum heat output of the heat pump is decisive for setting the size of the heat exchanger surface area:

- Heat exchanger surface area = 0.3-0.4 m^2 per kW max. heat pump heat output during the operating time of the system (air/water heat pumps with A20/W55)
- In 2-stage heat pumps, the output of the first stage can be used

Power requirement for special applications
If the heat pump is also used, for example, to heat swimming pools, it is important to take the greatly increased energy requirement into consideration in the design phase.
In the case of an outdoor swimming pool which is only heated outside the heating season, the increased annual runtimes mean that the heat source needs to be correspondingly enlarged (only for geothermal heat).
If an indoor swimming pool is heated all year round, the required output for room heating and heating of the water in the pool must be added to the total output, in addition to the increased runtime.

Installation
The system must be filled in accordance with the applicable standards.
Where copper is used as an installation material, damage to the rubber tubes used with heat pumps to reduce the structure-borne sound level may occur. As an alternative, corrugated stainless steel tubing can be used (on site). However, such pipes bring less reduction of structure-borne sound.
An air separator must be installed in the flow pipe.
A sludge separator must be installed in the return line to the heat pump.

Baking out
The baking out of buildings and floors (underlays) must not be done with Hoval heat pumps. If this instruction is not observed, the additional load can lead to irreparable damage to the heat source. Failure to do so may result in losses of guarantee/warranty. Alternative heat sources should thus be used for the baking out.
This is generally done by installing an electric water heater.
However, mobile heaters running on electricity, oil or gas can also be used.

Operating modes
Monovalent:
As a stand-alone heat generator, the heat pump covers all heat demands at all times. For the monovalent operating mode, ensure that the maximum achievable flow temperature of the heat pump is greater than the maximum required flow temperature of the heating.

Bivalent parallel and single energy source:
The heat pump alone heats until the switch-on point (bivalent point) is reached. An additional heat generator then heats the water in parallel to this. If this additional heat generator is an electric heating element, then the operating mode is monoenergetic. For a bivalent parallel operating mode, ensure that the maximum achievable flow temperature of the heat pump is greater than the maximum required flow temperature of the heater.

Bivalent alternative:
The heat pump alone heats until the switching point (bivalent point) is reached. An additional heat generator then heats the water alone. For the alternative bivalent operating mode, ensure that the maximum achievable flow temperature of the heat pump is greater than the maximum flow temperature of the heater. Higher temperatures are thereafter possible with the additional heat generator.

Bivalent semi-parallel:
The heat pump alone heats until the switch-on point (bivalent point) is reached. An additional heat generator then heats in parallel to this until the switch-off point of the heat pump. The heat pump can be switched off in this case either based on efficiency or energy cost criteria, taking account of the necessary flow temperature.

Performance data

The standard points for specifying the relevant values are clearly defined. The following conditions apply to heat pump systems:
Air/water A2W35
Brine/water B0W35
Water/water W10/W35

Heat source:

- A2 = air inlet temperature 2 °C
- B0 = brine inlet temperature 0 °C
- W10 = water inlet temperature 10 °C

Heat utilisation (heating):

- W35 = water outlet temperature 35 °C

Electrical data

The grid operators require the following information in order to grant approval:

Imax (A)	=	max. current consumption of the heat pump. Used for setting the dimensions of the feeder cable and fusing.
Starting current (A)	=	current consumption on direct starting with external starting current limiter
cos ϕ	=	power factor; used for setting the dimensions of any power factor correction

This information specific to heat pumps is listed for the specific products in the Hoval catalogue and on the heat pump rating plate.

The required clarifications and the approval request must be made during the planning phase of the system. The approval of the responsible grid operator must have already been obtained when the heat pump is ordered!

If the inrush current exceeds the maximum values defined by the grid operator (system), a frequency converter must be supplied or installed by the client.

Water quality in heating systems

Filling and replacement water, heating water

The following applies:
- For Germany VDI 2035
- For Austria ÖNORM H5195
- In addition, the EN 14868 standard must be applied, **as well as the manufacturer-specific specifications**

Manufacturer-specific specifications

Filling and replacement water
The filling and replacement water can be both fully demineralised and also merely softened.

Heating water
- In the case of full demineralisation of the filling and replacement water, the electrical conductivity of the heating water must not exceed the value of 100 µS/cm.
- In the case of softening the filling and replacement water, the following conditions must be complied with:
  - Electrical conductivity of the heating water for operation with water containing salts: > 100 µS/cm to ≤ 1500 µS/cm
  - pH value of the heating water for systems without aluminium alloy as water-side material 8.2 to 10.0 (measurement 10 weeks after commissioning at the earliest)
- The sum of the chloride, nitrate and sulphate contents in the heating water must not exceed 50 mg/l in total.

Additional notices
- Hoval heat pumps and calorifiers are suitable for heating systems without significant oxygen intake (system type I in accordance with EN 14868.)
- Systems with continual oxygen intake (e.g. underfloor heating without diffusion-proof plastic piping) or intermittent oxygen intake (e.g. requiring frequent topping-up) must be equipped with a system separation.
- If only the heat pump is replaced in an existing system, it is not recommended for the entire heating system to be refilled, provided that the heating water already contained in the system complies with the relevant directives or standards.
- Before filling new systems and, where necessary, existing heating systems containing heating water that does not comply with the directives or standards, the heating system must be professionally cleaned and flushed. The heat pump must not be filled until the heating system has been flushed.

Frost protection agent
See separate engineering sheet “Use of frost protection agent”.

Water composition

Water quality

Heating water:
- The requirements of European standard EN 14868 and the SWKI directive BT 102-01 must be met
- Hoval heat generators are suitable for heating systems without significant oxygen intake (system type I in accordance with EN 14868)
- Systems with
  - **continuous** oxygen intake (e.g. underfloor heating systems without diffusion-proof plastic piping) or
  - **intermittent** oxygen intake (e.g. requiring frequent topping-up)

  must be equipped with **separate circuits**
- Treated heating water must be tested at least once every year, or more frequently if specified by the manufacturer of the inhibitor
- In the case of existing systems (e.g. replacing the heat generator), if the water quality of the existing heating water meets the requirements of BT 102-01, re-filling the system is not recommended
- Before filling new systems and, where necessary, existing systems, the heating system must be professionally cleaned and flushed! The heat generator must not be filled until the heating system has been flushed
- Parts of the heat generator/calorifier which come into contact with water are made of copper and stainless steel
- Due to the danger of stress cracking corrosion to the stainless steel part and pitting in the copper part of the heat generator, the chloride, nitrate and sulphate content in the heating water must not exceed 100 mg/l in total
- The pH value of the heating water should be between 8.3 and 9.0 after 6-12 weeks of heating operation to avoid obstruction of the flow as a result of deposits of corrosion products from other heating system materials

Filling and replacement water:
- As a rule, the best filling and replacement water for a system with Hoval heat generator is untreated domestic water. The requirements of EN 14868 must be met in this context
- To maintain the high efficiency of the heat generator, the water content of the system and the maximum flow temperature should not exceed the values in the tables, based on the output of the heat generator (smallest heat generator for systems with more than one heat generator)
- The total quantity of filling and replacement water added to the heat generator over its service life must not be higher than three times the system water content
- SWKI BT 102-01 applies to the protection of the heating system, and it makes the exact specifications for the filling water quality.

Engineering checklist for heat pump systems

- Definition of hydraulic diagram according to Hoval standard for heating, possibly hot water and cooling
- Dimensions of heat pump type selected according to Qh, flow temperature and operating method and application limits (tables/heat output curves/bivalence point)
- Define minimum size of buffer storage tank
- Observe placement and bringing in possibility of heat pump, buffer storage tank and calorifier
- Configuration of calorifier with corresponding size and required heat register size according to table
- Clarification of electrical supply with energy supply company (conditions/off-periods/connected load)
- Clarification of subsidy amounts and ancillary conditions

Air/water heat pumps
Split version
- Installation location of outdoor unit/position: air outlet and intake must be clear
- No parts and systems at risk of frost damage are allowed to be on the blow-out side
- The necessary clearance (see “Dimensions/space required”) and accessibility must be assured
- Noise development requires minimum distances from sensitive rooms in adjacent buildings. These must be complied with (country-specific requirements)
- There must be a condensate drain for the outdoor unit
- The indoor unit must be positioned so the necessary clearances are complied with
- Pipes (refrigerant) must be routed in accordance with the specifications in the installation instructions
- Direct connection to the heating network only by differential pressure relief valve (minimum flow rate) and intermediate tank (minimum water volume)
- Possible selection of type with cooling function
- Cooling with fan convectors (caution: condensate drain for fan convectors)

Brine/water heat pumps
Clarification of geothermal probe holes
- Installation location (not under bedroom)
- Geothermal probe calculation (domestic hot water supplement/number of probes/pressure drop calculation (aim for minimum current consumption of brine pump))

Air/water heat pumps
Monoblock
- Installation location (indoor or outdoor). Air outlet and intake must be clear. Comply with notes on air guidance
- No parts and systems at risk of frost damage are allowed to be on the blow-out side
- The necessary clearance (see “Dimensions/space required”) and accessibility must be assured
- Noise development (not under bedrooms)
- Noise development requires minimum distances from sensitive rooms in adjacent buildings. These must be complied with (country-specific requirements). Provide damping measures if required
- There must be a condensate drain

Ground water heat pumps
Clarification of ground water approval
- Geological water inspection report
- Ground water temperatures summer + winter/quantity in l/min or m^3/h
- Installation location (not under bedroom)
- Connection of ground water only via separating heat exchanger (intermediate carrier circuit). Separating heat exchanger is configured according to the heat pump type (table). Caution: intermediate carrier circuit: read out heat output and flow temperature at brine/water +7 °C)
- Design of ground source heat pump and possible intermediate circuit pump according to nominal flow rates and pressure drops
- The intermediate circuit is filled with frost protection agent for frost protection of -15 °C

Version and commissioning

Clarify which installation location and which system concept are provided, and contact Hoval in case anything is unclear.

Checks before installation
The following checks are required before installation:
- Consult the installation, operating and maintenance instructions of the Hoval heat pumps
- Access for the purpose of operation and maintenance
- Dimensions and position of the masonry openings
- Position of heating connections and condensate drain
- Position of the condensate drain
- Drainage of the air ducts or set-up area for the heat pump and acoustic insulation of the air ducts
- Setting up the heat pump (clearances, minimum distances)

Hydraulics
- Check the hydraulic piping of the system according to be selected hydraulic schematic
- Clarify any open issues before installation
- The wiring diagram does not serve as a hydraulic schematic, but merely for positioning of sensors, valves, pumps and thermostats, etc.
- Fittings and instruments must be installed according to the corresponding engineering documents

Electrical installation
- The electrical connection cables to the heat pump must be installed in accordance with Hoval's and the country's specific regulations. Do not attach any rigid connections (e.g. cable duct) to the heat pump housing
- The information on the system diagram must be complied with
- Quality and routing regulations for the sensor cables must be complied with
- The low-voltage cables must be routed separately (not in the same cable duct as 230 V or 400 V cables)
- Comply with the connection requirements of the grid operator (TAB 2019)
- If a frequency converter is required (starting current), it must be supplied by the client

Checks before commissioning
The following items must be checked before notifying Hoval that the system is ready for commissioning:
- Hydraulic piping
- Positioning and installation of the instruments and fittings
- Positioning and installation of the sensors according to the corresponding wiring diagram or project diagram
- Electrical connections for heat pump, control systems, sensors, pumps, motorised valves, etc.
- Functions of the complete heat source system
- Flushing, filling and venting of the complete system

Geothermal probe systems/surface collectors
Comply with the following in geothermal probe systems that are filled with a mixture of frost protection agent and water:
- Fully demineralised water must be used
- The concentration of frost protection agent must be selected at least so as to ensure protection against frost down to -15 °C and so that the required minimum concentration stipulated by the frost protection agent manufacturer is maintained (protection against sludge formation and corrosion). However, the frost protection concentrations should be kept as low as possible with a view to improved heat transmission and lower pump output
- The frost protection agent and the water must be mixed in the required concentration prior to filling. Filling with ready-mixed solution that meets the aforementioned requirements is recommended

Caution!
The condenser and evaporator of a heat pump are sensitive to blockage, as a result of which the system must be flushed carefully on the heating and source sides before the heat pump is connected. The heat exchanger should not have any flow during the flushing procedure. The heating water must be treated according to the recommendations of the professional associations.

Hydraulic balancing/setting the flow rates
- The flow rates are calibrated by the installer. This should the based on the recommended nominal flow rate of the heat pump
- In systems with a buffer storage tank, the flow rate in the fully opened heat circuit must not be greater than the flow rate in the buffer circuit, otherwise the colder heating water return will overflow through the buffer storage tank, leading to mixed temperatures in the flow to the heating system.

Notice for commissioning
The registration form should be sent to Hoval 14 days in advance.

- The commissioning should be carried out during the heating period, the best time is during the transitional period
- Temporary electrical installations as well as systems operating in the building carcass are exposed to hazards (electrical power cuts, incorrect operation by third parties, etc.) which can lead to damage to the heat pump and the entire system
- In systems in the building carcass, it is not possible to maintain the boundary conditions such as installation location without frost risk, minimum required return temperature, etc. for the heat pump in practical terms, meaning that no correct operation is assured

Caution!
- *Air/water heat pumps*
  The heat output of the air/water heat pump is significantly dependent on the outdoor temperature, as a result of which no commissioning activities should be undertaken at temperatures close to the freezing point, in the building carcass for drying out of the structure or for routing underfloor heating pipes (provide buffer storage tank with an electric heating element). Split pipes can only be evacuated properly at a temperature above 8 °C, as a result of which the equipment room must have a room temperature of at least 15 °C. Due to the risk of moisture entering the refrigeration circuit, the outdoor unit cannot be connected in rainy weather. During commissioning, the room temperature of the heated rooms must be at least 15 °C. If a buffer storage tank is provided, its heating water temperature is not allowed to be less than 20 °C during commissioning.
- *Brine/water heat pumps*
  The brine/water heat pumps with geothermal probes as the heat source are not suitable for drying out the building carcass or for laying underfloor heating pipes, due to the output/load mixing ratio. The long running times of the heat pump can lead to excessive use of the geothermal probes and thus long-term damage as well as a lower utilisation temperature and even the establishment of permafrost.

Commissioning
It is used for checking and setting the definitive operating values of the system as well as for instructing the operating personnel.
During commissioning, the engineering setpoints of the system must be known, and the following persons must be present:
- The installer to inspect the heating-side installation
- The electrician to inspect the electrical installation
- Hoval Service
- The building owner or the person responsible for operation. Hoval service only prepares the commissioning protocol of the heat pump or the system parts supplied by Hoval. The operating instructions for the Hoval heat pumps and the accessories supplied by Hoval are delivered with the articles or handed over during commissioning.

Caution!
If Hoval is required to undertake commissioning in uninhabited building carcasses without the required general conditions and proficiently undertaken electrical and heating installation of the system incl. bleeding, Hoval will not accept liability for operation. The system is operated at the owner's own risk. The required visits to the system will be invoiced separately.

The installer/planner of the system is responsible for the operating instructions and for providing instruction in third-party products and/or the entire system!
All Hoval hydraulic schematics and engineering guidelines serve as aids during planning. The planner/installer of the system is responsible for its correct functioning.

Heat sources
The heat source (with the exception of the temperature level of the heating system) significantly determines the efficiency, the operational safety and efficiency of a heat pump system. The most important factors are
- unrestricted availability during the utilisation period
- temperature level of the heat source during the utilisation period
- energy required for transporting the heat source
- chemical and physical safety of the heat source (working safety, maintenance work involved)

Proficient planning and undertaking of the heat source use are amongst the most important tasks for the planning and installer.

Heat sources that are predominantly used for heating living areas are natural and renewable heat sources such as:
- Fresh air
- Ground
- Ground water, waste water
- Surface water (lakes, rivers)

Waste heat utilisation with heat pumps involves using the heat pump for heat recovery in which the planning must take account not only of the usual criteria such as temperature level, type (waste water, extract air, exhaust gas), chemical and mechanical cleanliness, etc. but also the simultaneity of availability and heat use. A precise analysis is absolutely essential.

Fresh air
Fresh air is available everywhere. The following aspects must be considered when planning with fresh air as the heat source:
- Area of application of the heat pump
- Output fluctuations of the heat pump due to temperature fluctuations of the heat source
- Defrosting losses of the heat pump
- Sound emission
- Condensation formation
- In coastal regions or other areas with salty air, corrosion can decrease the lifetime of the evaporator

Heat pumps have clearly defined application limits, which means it is essential to consider the application limits when designing the system.

Ground
Setting up and operating geothermal probes and ground source collectors requires official approval. The heat capacity and thermal conductivity of the soil depend on its composition and water content. It is possible to use it in two different ways
- Vertically with geothermal probes
- Horizontally with ground collectors

Observe the following:
- The heat withdrawn must always be significantly less than can be replenished naturally
- In bivalent systems, the dimensions of the heat source system must be suitable with regard to the amount of heat withdrawn (90 kWh per metre of geothermal probe length)

Geothermal probes
The planning criteria are:
- The specific heat extraction rate which depends on the thermal conductivity (λ) of the underground; a specific cooling capacity of max. 47 W/m probe length can be assumed as guidance values
- The max. heat extraction per year should not exceed 90-100 kWh per metre of geothermal probe length

In addition, the following aspects need to be considered:
- The lowest possible total hydraulic resistance through optimisation of the number of geothermal probes, probe diameter and depth
- **A certified, specialist drilling company must be used for planning and undertaking the geothermal probe system**

Ground collectors
The energy that is used for compensating for the heat deficit or heat surplus comes almost exclusively from solar radiation and percolating water (rain, snow meltwater). A ground collector is, so to speak, as climate collector which is significantly influenced by weather events. The latent heat exploitation when there is a change of state in the water in the moist soil has a positive influence when it comes to calculating the balance. This means the evaporating temperature of the heat pump remains relatively constant over a long time. VDI 4640 must be taken into account during the design, as well as:

for the soil surface
- the climate zone and the aspect of the building
- the thermal conductivity of the soil and the effective number of operating hours

for the ground collector system
- the lowest possible total resistance
- by optimisation of the number of lines and line length
- If there is insufficient floorspace available, a pressure equalisation can be provided for regenerating the ground collector (e.g. roof collector)

For further details see:
Heat source use/ground collectors.

Ground water
If the temperature of the heat source for the heat pump is below 8 °C in the seasonal profile, this must be taken into account in the planning.

Using ground water as a heat source requires official approval. Ground water is a very good heat source because of its high heat capacity and heat transfer properties.
Connection of ground water only via a separating heat exchanger (intermediate carrier circuit).
System-based clarifications are mandatory.
The most important criteria are:
- Hydro-geological report
- Water analysis
- Official approval/concession

In addition, the following aspects must be considered for the planning:
- The min. heat source temperature during the utilisation period
- The min. permitted evaporator outlet temperature of the selected heat pump
- The specifications of the authorities, such as the type of use, the design of the withdrawal and return well, etc.
- A qualified specialist company must be contacted for planning and installing the heat source system

In addition, the following aspects must be considered for the planning:
- VDI 4640
- Min. heat source temperature and flow rate during the utilisation period
- Official regulations such as type of use, configuration of the withdrawal and return well, etc.
- Possibility of infiltration through water from rivers or lakes
- The design must be based on reliable temperature data
- A certified, specialist drilling company must be used for planning and undertaking the system of ground water boreholes

The heat source must be free of chemical or mechanical contamination.

Surface water
If the temperature of the heat source for the heat pump is below 8 °C in the seasonal profile, this must be taken into account in the planning.

Planning a heat source system with sweet/river water, etc. as the heat source is a challenging task and demands great experience from the planner. Surface water use must be via an intermediate carrier circuit (separating heat exchanger). Under favourable conditions, for example close to the bank, it is possible to provide a filtering well (as with ground water) as well as an intermediate circuit (indirect use).

Use is not advised without reliable long-term information about the min./max. temperature of the heat source and chemical/mechanical safety.

A feasibility analysis and estimating the maintenance work involved are preconditions for implementation.

The dimensions of the heat exchanger for indirect use are as for ground water.

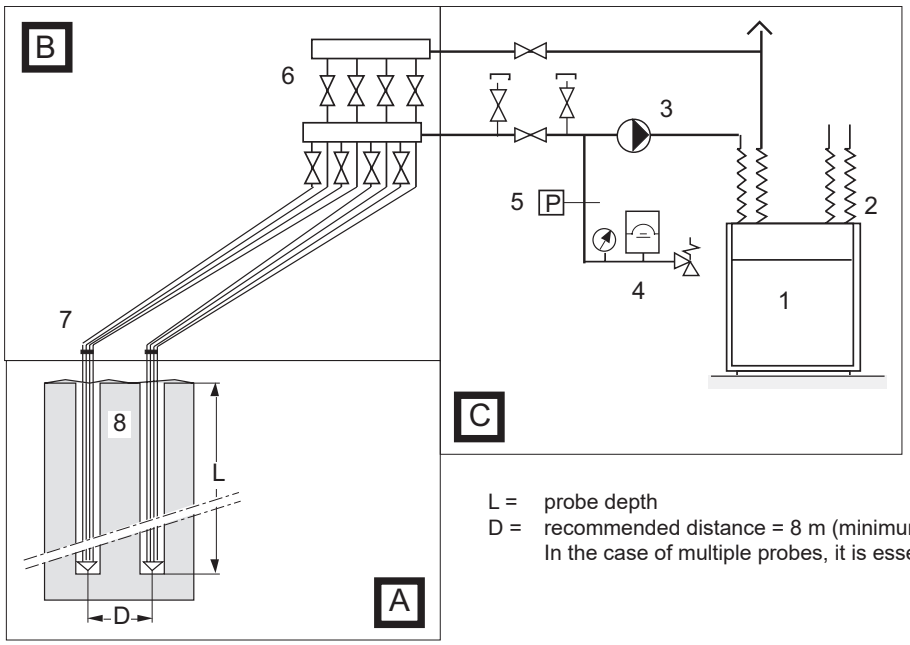
Using public surface water must be reported to the responsible water resources authority, as in the case of ground water use.

A qualified specialist company must be contacted for planning and installing the heat source system.

Heat sources

Geothermal probes

Schematic diagram heat sources/geothermal probes
- Geothermal probe system



Field A) Geothermal probes
Drilling of geothermal probes including delivery and installation of the probe pipes. Backfilling with bentonite.

Field B) Connections
Manifolds/collectors, connection lines, making penetrations in walls and trenching.

Field C) Heat pump connection
Connecting pipes between manifold/collector and heat pumps incl. heat source feed pump, safety devices and fittings.

L = probe depth
D = recommended distance = 8 m (minimum 5 m)
In the case of multiple probes, it is essential to clarify the placement.

Legend		Field	Delivery	Installation
1	Heat pump	C	Hoval	Installer
2	Flexible connections	C	Hoval	Installer
3	Heat source feed pump (Cold water version)	C	Hoval	Installer
4	Diaphragm pressure expansion tank	C	Hoval	Installer
5	Pressure monitor	C	Hoval	Installer
6	Distributor/collector (PVC/C)	B	Installer	Installer
7	Connecting line (HDPE 32 or 40 mm Ø)	B	Drilling company or installer	on behalf of the installer
8	Geothermal probes	A	Certified drilling company	Drilling company on behalf of the client

If the heat source system is filled with water only, it must be specially dimensioned. It is mandatory to install a flow monitor and a frost protection thermostat.

Heat sources

Ground water

Preliminary information required

- Suitability regarding quantities and temperatures (t ≥ 6 °C)
- Official approval
- Hydro-geological report
- Water analysis
- The effective minimum ground water temperature

Indirect utilisation with ground water

- The minimum ground water temperature during the utilisation period determines the tapping volume (required flow rate)
- In the case of river or sweet water, it is imperative to determine the precise temperature progression during the heating period
- The intermediate heat exchanger must be suitable for use with river or sweet water. Strainers and, if necessary, backwash filters are necessary to protect against contaminating particles such as sand. It must be possible to clean the heat exchangers.
- A filter must be installed upstream of the plate exchanger
- The hydraulic piping of the system must be carried out according to the selected hydraulic schematic.
- The intermediate circuit is filled with frost protection agent according to the engineering guidelines. The output of the heat pump can thus be read off for brine +5 °C.
- The intermediate circuit pump must be planned in a cold-water design

Direct utilisation of ground water

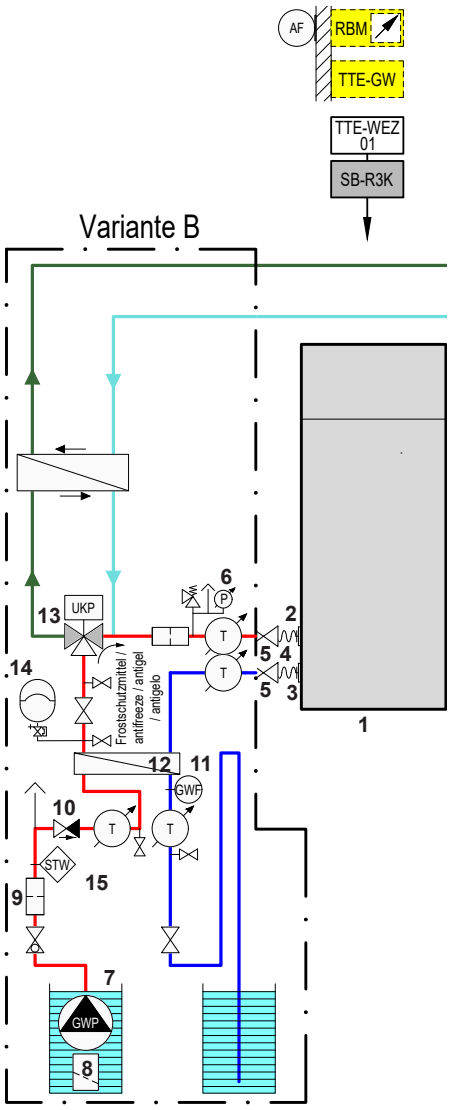
State-of-the-art evaporator design (soldered plate heat exchangers) makes applications with a direct throughflow of ground water inadvisable

- These evaporators have very narrow flow channels and are extremely sensitive to even very fine dirt particles such as those abundant in ground water
- If individual channels become blocked, they can freeze, resulting in leakage towards the refrigeration circuit. This can cause irreparable damage to a machine
- Flow monitors and frost protection thermostats cannot detect obstructions, as the deviations are too slight to be registered
- Upstream fine filters can only solve the problem of obstructions to a certain extent, and need frequent cleaning
- The somewhat lower performance coefficient is more than compensated for by the high operational reliability
- In such cases, Hoval will not accept liability for damage to the evaporator

Notices:

- The ground water temperature varies according to location.
- The design must be based on reliable temperature data
- The heat source system, (withdrawal and return well) must be installed by a specialist company

The heat source must be free of chemical or mechanical contamination.



1 Heat pump
2 Heat source inlet
3 Heat source outlet
4 Flexible connections
5 Pressure measurement nozzle ⅜″
6 Pressure monitor
7 Heat source feed pump
8 Suction filter
9 Filter
10 Non-return valve
11 Frost protection temperature monitor
12 Plate heat exchanger
13 Delivery pump in heat source intermediate circuit (cold-water design)
14 Diaphragm pressure expansion tank
15 Flow monitor

Other recommended components:

- Flow jacket (when in use)
- Securing/recovery rope
- Rope clamp
- Dry running protection
- Wall anchor
- Water quantity meter
- Vacuum breaker or pressure holding valve

Notice
In the case of systems without an intermediate heat exchanger, Hoval accepts no liability for damage caused by soiling or freezing of the evaporator!

Heating

Heat utilisation system

Heating

The heat pump is a compression cooling machine and behaves very dynamically.
This requires suitable flow rates through the heat exchangers of the heat pump on both the heat source and heat utilisation side. Since the heat exchangers of the heat pump have very low water contents, the constantly changing heat output demand of the system (predominant time of the heating period!) leads to excessive switching frequencies. However, short intervals mean insufficient time for stabilisation of the refrigeration circuit (loss of efficiency) on the one hand, and can lead to compressor failures on the other. In addition, there is the requirement of the electricity companies, which limit the switching frequency to 3 times per hour due to grid stability considerations.
Therefore, suitable measures must be taken or the system must be planned in such a way that the boundary conditions of the heat pump and the requirement of the electricity company can be met at all times.
The most important criteria for meeting the boundary conditions are:

- Correct flow rate through the heat pump during the entire time of use
- Sufficient storage capacity and a minimum water volume of the heat utilisation side (heating)

Underfloor heating systems without thermostatic valves can meet these requirements in most cases.
If the boundary conditions cannot be met, the heat pump must be hydraulically separated from the heat utilisation system (heating). A buffer storage tank is required for this. The buffer storage tank ensures that the boundary conditions of the heat pump can be met in any load condition of the system.

Water heating

Generous dimensioning of the calorifier in terms of heat exchanger and drinking water volume is recommended. The maximum heat output of the heat pump is decisive for setting the size of the heat exchanger.

- Recommended heat exchanger area 0.3-0.4 m^2 per kW max. heat output of the heat pump during the operating time of the system (air/water heat pumps at A20/W50)
- Min. drinking water volume = daily requirement
- In two-stage heat pumps, the output of the first stage can be used.

Example Heating

System example:
Brine/water and water/water heat pumps without buffer storage tank

Application
Underfloor heating with heat storage capacity, low temperature heating system with heating group without thermostatic valves

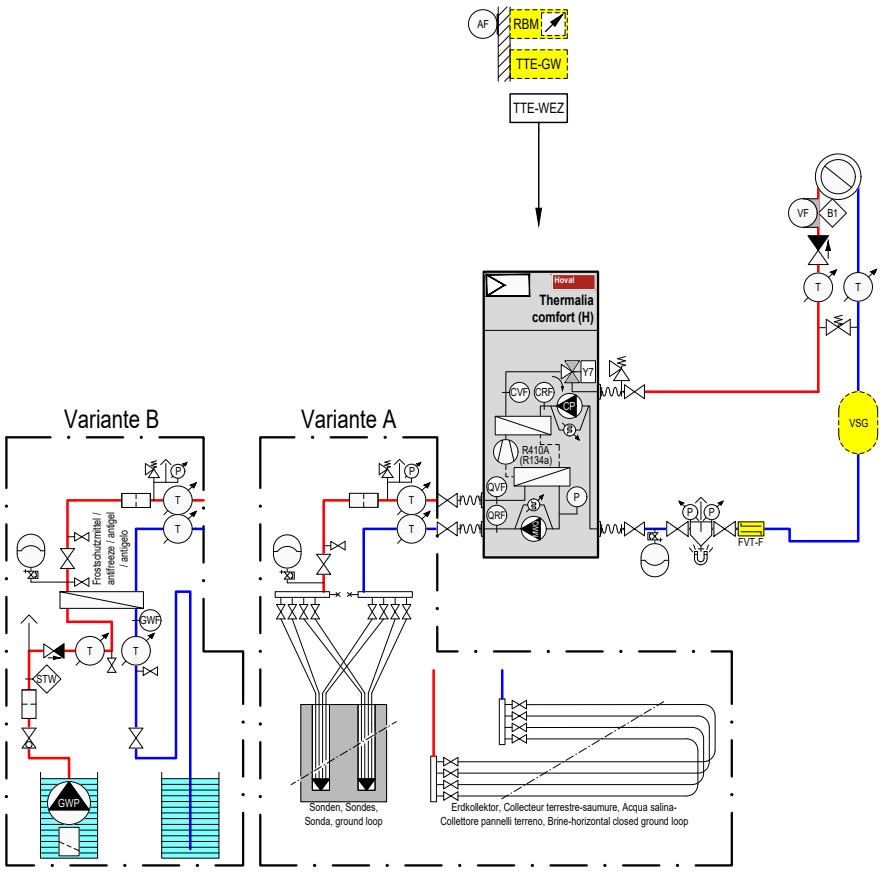
Heat pump function
The heat pump works in dependence on the outdoor temperature (2-point regulator) with continuously controlled operating mode. The underfloor heating balances unfavourable output/load ratios.

The heat pump is put into operation when the temperature level in the return falls below a preset level. Switch-on and switch-off command via return sensor.
The switching difference is adjustable.
The additional re-switching delay allows a maximum of 3 starts per hour.
The switching function is controlled by a microprocessor, allows long runtimes and ensures a higher annual coefficient of performance for the heat pump.

Heating controller
The weather-controlled heating controller (2-point controller) guarantees a good heat supply to the heating system and works in a user-defined manner.

Ensure a minimum system water content.

If the heating circuits are equipped with thermostatic valves, a bypass with a relief valve must be installed.



Notice
The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.

Example Heating

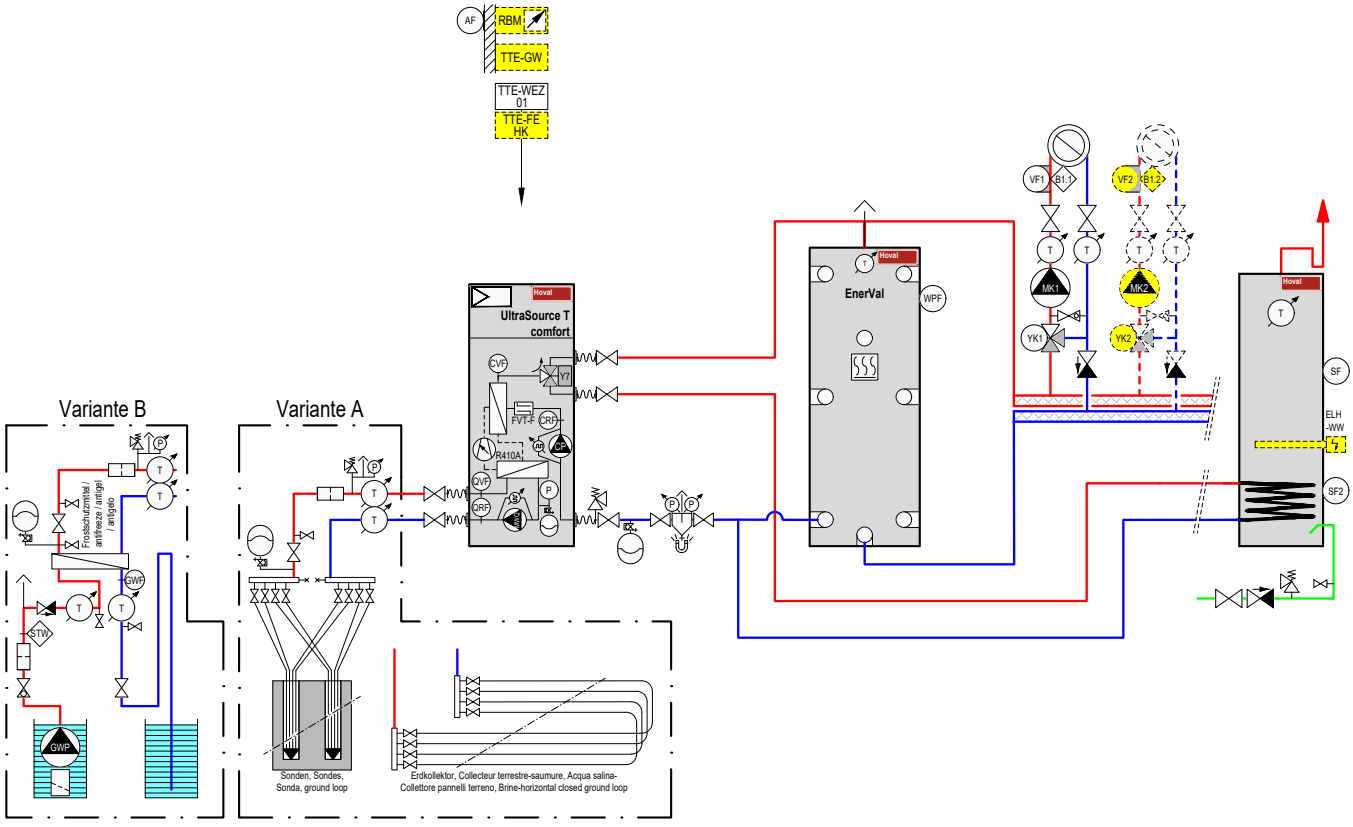
System example:
Brine/water and water/water heat pumps with buffer storage tank and calorifier

Application
Low temperature heating system with max. 2 heating groups, one buffer storage tank and one calorifier

Heat pump function
The heat pump works in dependence on the outdoor temperature (2-point regulator) with continuously controlled operating mode. The buffer storage tank balances unfavourable output/load ratios, allows energy-efficient and user-defined discharge and has a positive influence on the service life of the heat pump.

The heat pump is only put into operation when the temperature level in the buffer storage tank no longer meets heating system requirements and is taken out of operation when the additional output can no longer be absorbed by the buffer storage tank.
The switching difference is adjustable and allows long runtimes.
The additional re-switching delay allows a maximum of 3 start-ups per hour and guarantees a long service life. The switching functions are controlled by a microprocessor, ensuring long runtimes and a high annual Coefficient of Performance for the heat pump.

Heating controller
The weather-controlled heating controller (3-point controller) as a discharge control guarantees an optimum heat supply to the heating system and works in a user-defined manner for maximum convenience.



Notice
The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.

Flat collectors DA 25, 120 m
Laying distance 0.5 m

Heating load (incl. domestic hot water)		kW	UltraSource® T comfort/ compact (8) 3	4	5	6	7	UltraSource® T comfort/ compact (13) 8	9	10	11	12	13	UltraSource® T comfort (17) 14	15	16	17	18
15 W/m²	Required area	m²	160	213	260	313	367	427	480	533	587	640	693	747	800	853	907	960
	Number of collector circuits	units	4	5	6	7	8	9	10	12	13	14	15	16	17	18	19	20
20 W/m²	Required area	m²	120	160	195	235	275	320	360	400	440	480	520	560	600	640	680	720
	Number of collector circuits	units	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15
25 W/m²	Required area	m²	96	128	156	188	220	256	288	320	352	384	416	448	480	512	544	576
	Number of collector circuits	units	2	3	3	4	4	5	5	6	6	7	7	8	8	9	10	10
30 W/m²	Required area	m²	80	107	130	157	184	214	240	267	294	320	347	374	400	427	454	480
	Number of collector circuits	units	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	8
35 W/m²	Required area	m²	69	92	112	135	158	183	206	229	252	275	298	320	343	366	389	412
	Number of collector circuits	units	2	2	2	3	3	4	4	4	5	5	5	6	6	7	7	7

Type			Thermalia® comfort (8)	(10)	(13)	(17)	H (7)	H (10)
15 W/m²	Required area	m²	393	560	707	907	340	473
	Number of collector circuits	units	9	12	15	19	8	10
20 W/m²	Required area	m²	295	420	530	680	255	355
	Number of collector circuits	units	7	9	12	15	6	8
25 W/m²	Required area	m²	236	336	424	544	204	284
	Number of collector circuits	units	4	6	8	10	4	5
30 W/m²	Required area	m²	197	280	354	454	170	237
	Number of collector circuits	units	4	5	6	8	3	4
35 W/m²	Required area	m²	169	240	303	389	146	203
	Number of collector circuits	units	3	4	6	7	3	4

Type			Thermalia® twin (20)	(26)	(36)	(42)	H (13)	H (19)	H (22)
15 W/m²	Required area	m²	1080	1380	1880	2213	640	927	1087
	Number of collector circuits	units	23	29	40	47	14	20	23
20 W/m²	Required area	m²	810	1035	1410	1660	480	695	815
	Number of collector circuits	units	17	22	30	35	10	15	17
25 W/m²	Required area	m²	648	828	1128	1328	384	556	652
	Number of collector circuits	units	11	14	19	23	7	10	11
30 W/m²	Required area	m²	540	690	940	1107	320	464	544
	Number of collector circuits	units	9	12	16	19	6	8	10
35 W/m²	Required area	m²	463	592	806	949	275	398	466
	Number of collector circuits	units	8	10	14	16	5	7	8

Type			Thermalia® dual R (55)	R (70)	R (85)	R (110)	R (140)	H (35)	H (50)	H (70)	H (90)
15 W/m²	Required area	m²	3027	3820	4433	5920	7193	1793	2700	3647	4453
	Number of collector circuits	units	64	80	93	124	150	38	57	76	75
20 W/m²	Required area	m²	2270	2865	3325	4440	5395	1345	2025	2735	3340
	Number of collector circuits	units	48	60	70	93	113	29	43	57	70
25 W/m²	Required area	m²	1816	2292	2660	3552	4316	1076	1620	2188	2672
	Number of collector circuits	units	31	39	45	60	72	18	27	37	45
30 W/m²	Required area	m²	1514	1910	2217	2960	3597	897	1350	1824	2227
	Number of collector circuits	units	26	32	37	50	60	15	23	31	38
35 W/m²	Required area	m²	1298	1638	1900	2538	3083	769	1158	1563	1909
	Number of collector circuits	units	22	28	32	43	52	13	20	27	32

Extraction rates

Soil type	Heat extraction rate [W/m²]
Dry, sandy soil	10-15
Moist, sandy soil	15-20
Dry, loamy soil	20-25
Moist, loamy soil	25-30
Silt	30-35
Sandy clay	35-40

- The design of flat collectors when using heat pumps with modulating output (types: UltraSource® T comfort and compact) is based on the heat load of the building in accordance with DIN EN 18231 and the demand for hot water. This total demand (total output) minus the nominal compressor input power corresponds to the heat extraction power required by the flat collector
- All information relates to a total running time per year of max. 1800 h (heating of living space and water heating). This corresponds to a monovalent configuration when the heat pump meets the required total output for heating and domestic hot water (standard systems without special use). If the operating time is longer, the heat source must also be enlarged correspondingly.

Flat collectors DA 32, 200 m
Laying distance 0.65 m

Heating load (incl. domestic hot water)		kW	UltraSource® T comfort/ compact (8) 3	4	5	6	7	UltraSource® T comfort/ compact (13) 8	9	10	11	12	13	UltraSource® T comfort (17) 14	15	16	17	18
15 W/m²	Required area	m²	160	213	260	313	367	427	480	533	587	640	693	747	800	853	907	960
	Number of collector circuits	units	2	2	2	3	3	4	4	4	5	5	6	6	6	7	7	8
20 W/m²	Required area	m²	120	160	195	235	275	320	360	400	440	480	520	560	600	640	680	720
	Number of collector circuits	units	1	2	2	2	3	3	3	3	4	4	4	5	5	5	6	6
25 W/m²	Required area	m²	96	128	156	188	220	256	288	320	352	384	416	448	480	512	544	576
	Number of collector circuits	units	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
30 W/m²	Required area	m²	80	107	130	157	184	214	240	267	294	320	347	374	400	427	454	480
	Number of collector circuits	units	1	1	1	2	2	2	2	3	3	3	3	3	3	4	4	4
35 W/m²	Required area	m²	69	92	112	135	158	183	206	229	252	275	298	320	343	366	389	412
	Number of collector circuits	units	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4

Type			Thermalia® comfort (8)	(10)	(13)	(17)	H (7)	H (10)
15 W/m²	Required area	m²	393	560	707	907	340	473
	Number of collector circuits	units	3	5	6	7	3	4
20 W/m²	Required area	m²	295	420	530	680	255	355
	Number of collector circuits	units	3	4	4	6	2	3
25 W/m²	Required area	m²	236	336	424	544	204	284
	Number of collector circuits	units	2	3	4	5	2	3
30 W/m²	Required area	m²	197	280	354	454	170	237
	Number of collector circuits	units	2	3	3	4	2	2
35 W/m²	Required area	m²	169	240	303	389	146	203
	Number of collector circuits	units	2	2	3	3	2	2

Type			Thermalia® twin (20)	(26)	(36)	(42)	H (13)	H (19)	H (22)
15 W/m²	Required area	m²	1080	1380	1880	2213	640	927	1087
	Number of collector circuits	units	9	11	15	17	5	7	9
20 W/m²	Required area	m²	810	1035	1410	1660	480	695	815
	Number of collector circuits	units	7	8	11	13	4	6	7
25 W/m²	Required area	m²	648	828	1128	1328	384	556	652
	Number of collector circuits	units	5	7	9	10	3	5	5
30 W/m²	Required area	m²	540	690	940	1107	320	464	544
	Number of collector circuits	units	5	6	8	9	3	4	5
35 W/m²	Required area	m²	463	592	806	949	275	398	466
	Number of collector circuits	units	4	5	7	8	3	3	4

Type			Thermalia® dual R (55)	R (70)	R (85)	R (110)	R (140)	H (35)	H (50)	H (70)	H (90)
15 W/m²	Required area	m²	3027	3820	4433	5920	7193	1793	2700	3647	4453
	Number of collector circuits	units	23	29	34	45	54	14	21	28	34
20 W/m²	Required area	m²	2270	2865	3325	4440	5395	1345	2025	2735	3340
	Number of collector circuits	units	18	22	25	34	41	11	16	21	26
25 W/m²	Required area	m²	1816	2292	2660	3552	4316	1076	1620	2188	2672
	Number of collector circuits	units	14	18	20	27	33	9	13	17	21
30 W/m²	Required area	m²	1514	1910	2217	2960	3597	897	1350	1824	2227
	Number of collector circuits	units	12	15	17	23	27	7	11	14	17
35 W/m²	Required area	m²	1298	1638	1900	2538	3083	769	1158	1563	1909
	Number of collector circuits	units	10	13	15	20	24	6	9	12	15

Extraction rates

Soil type	Heat extraction rate [W/m²]
Dry, sandy soil	10-15
Moist, sandy soil	15-20
Dry, loamy soil	20-25
Moist, loamy soil	25-30
Silt	30-35
Sandy clay	35-40

- The design of flat collectors when using heat pumps with modulating output (types: UltraSource® T comfort and compact) is based on the heat load of the building in accordance with DIN EN 18231 and the demand for hot water. This total demand (total output) minus the nominal compressor input power corresponds to the heat extraction power required by the flat collector
- All information relates to a total running time per year of max. 1800 h (heating of living space and water heating). This corresponds to a monovalent configuration when the heat pump meets the required total output for heating and domestic hot water (standard systems without special use). If the operating time is longer, the heat source must also be enlarged correspondingly.

Heating load (incl. domestic hot water)		kW	UltraSource® T comfort/ compact (8) 3	4	5	6	7	UltraSource® T comfort/ compact (13) 8	9	10	11	12	13	UltraSource® T comfort (17) 14	15	16	17	18
40 W/m	Total depth	m	60	80	98	118	138	160	180	200	220	240	260	280	300	320	340	360
	Frost protection	l	41	56	68	81	96	110	124	138	152	165	180	193	206	221	234	247
45 W/m	Total depth	m	54	72	87	105	123	143	160	178	196	214	232	249	267	285	303	320
	Frost protection	l	37	49	60	72	85	98	110	122	136	148	160	172	184	197	209	221
50 W/m	Total depth	m	48	64	78	94	110	128	144	160	176	192	208	224	240	256	272	288
	Frost protection	l	33	44	53	65	76	88	100	110	121	132	144	154	165	177	188	198
55 W/m	Total depth	m	44	59	71	86	100	117	131	146	160	175	190	204	219	233	248	262
	Frost protection	l	31	41	49	60	69	81	90	101	110	121	130	141	150	161	170	181
60 W/m	Total depth	m	40	54	65	79	92	107	120	134	147	160	174	187	200	214	227	240
	Frost protection	l	28	37	45	55	64	73	82	92	101	110	120	129	138	148	157	165

Type			Thermalia® comfort (8)	(10)	(13)	(17)	comfort H (7)	(10)	twin (20)	(26)	(36)	(42)
40 W/m	Total depth	m	148	210	265	339	128	178	405	518	705	830
	Frost protection	l	105	149	188	241	91	127	288	369	502	591
45 W/m	Total depth	m	132	187	236	301	114	158	360	460	627	738
	Frost protection	l	94	133	168	214	81	113	256	327	446	525
50 W/m	Total depth	m	118	168	212	271	102	142	324	414	564	664
	Frost protection	l	84	119	151	193	73	101	231	295	401	473
55 W/m	Total depth	m	108	153	193	247	93	130	295	377	513	604
	Frost protection	l	77	109	137	176	66	92	210	268	365	430
60 W/m	Total depth	m	99	140	177	226	85	119	270	345	470	554
	Frost protection	l	70	100	126	161	60	85	192	246	335	394

Type			Thermalia® twin H (13)	(19)	(22)	dual, dual R (55)	(70)	(85)	(110)	(140)	dual H (35)	(50)	(70)	(90)
40 W/m	Total depth	m	240	348	408	1135	1433	1663	2138	2698	670	1013	1365	1675
	Frost protection	l	171	248	290	808	1020	1183	1522	1920	477	721	972	1192
45 W/m	Total depth	m	214	309	363	1009	1274	1478	1900	2398	596	900	1214	1489
	Frost protection	l	152	220	258	718	907	1052	1352	1706	424	641	864	1060
50 W/m	Total depth	m	192	278	326	908	1146	1330	1710	2158	536	810	1092	1340
	Frost protection	l	137	198	232	646	815	946	1217	1536	381	577	777	954
55 W/m	Total depth	m	175	253	297	826	1042	1210	1555	1962	488	737	993	1219
	Frost protection	l	124	180	211	588	742	861	1106	1396	347	524	707	868
60 W/m	Total depth	m	160	232	272	757	955	1109	1425	1799	447	675	910	1117
	Frost protection	l	114	165	194	539	679	789	1014	1280	318	480	647	795

* The total depth and the frost protection concentration are calculated for duplex probes (4 x 32 x 2.9) and corresponds to 33 % in vol. Hoval frost protection concentrate for a frost protection of -15 °C. The frost protection for the connection pipes and supply pipes is to be calculated separately. The dimensioning table offers reference values for planning and is not intended as a substitute for geological evaluation.

Where the total depth is split between several boreholes, an additional allowance must be made.
These allowances depend, amongst other things, on the distance between the boreholes.

Extraction rates

Soil type	Heat extraction rate [W/m]
Sand, dry gravel	< 25
Sand, grit, aquiferous	65-80
Clay, moist loam	35-50
Solid limestone	55-70
Sandstone	65-80
Acidic magmatite (e.g. granite)	65-85
Basic magmatite (e.g. basalt)	40-65
Gneiss	70-85

- The design of flat collectors when using heat pumps with modulating output (types: UltraSource® T comfort and compact) is based on the heat load of the building in accordance with DIN EN 18231 and the demand for hot water. This total demand (total output) minus the nominal compressor input power corresponds to the heat extraction power required by the flat collector
- All information relates to a total running time per year of max. 1800 h (heating of living space and water heating). This corresponds to a monovalent configuration when the heat pump meets the required total output for heating and domestic hot water (standard systems without special use). If the operating time is longer, the heat source must also be enlarged correspondingly.

1 Explanation
To use the geothermal heat, geothermal collector circuits made of plastic with 120 m each are laid horizontally and at a depth of approx. 1.2 m to 1.5 m. The collector pipes contain a mixture of water and frost protection agent which is circulated by means of a circulating pump. The energy is transferred to an intermediate heat exchanger, which is where the evaporation takes place.

2 Laying depth
Depending on the depth of frost penetration, at least 20 cm under. A laying depth of between 1.2 m and 1.5 m is generally sufficient. Laying depths more than 2 m are to be avoided.

3 Laying distance
In practice, routing is carried out with the following average distances:
Pipe DA 25 = 0.5 m
Pipe DA 32 = 0.65 m

4 Laying area
The laying area must be grown and must not be raised unevenly. Before the first heat extraction, the ground has to be compressed. The surface must be undeveloped and even, have only a minimal slope and moreover may not be built on and/or sealed (asphalted, concreted over) at a later point in time. Sloping sites should be avoided because of the risk of slipping, but do not represent a problem for the function of the heat pump system.
It is important on sloping sites that the collector is laid across the slope, and that the distributor is located at the highest point if possible (ventilation). The location of the flat collector must be entered on a plan which remains attached to the heat pump.

5 Bringing in the collectors
The collector pipes cannot be kinked or dented. The circuits are laid in a sand bed of approx. 10 cm. The circuits are then covered on every side with sand in order to protect them and to allow optimum heat transfer. The sand not needed between the collectors can be used for this. The circuits of 120 m each are to be laid in their entirety (do not shorten them!) and extended into the shaft and/or into the basement approx. 1 m or until assembly can be carried out smoothly at the distributor. When it is being filled, the collector must be kept under 3 bar (pressure protocol). It is recommended to lay warning tapes approx. 50 cm above the collector pipes. The brine circuit is to be filled with a water-frost protection agent mixture with a frost protection of -15 °C (when using the 33 % in vol. Hoval frost protection concentrate). Practical guide: Use water that has been preheated to 30 °C when mixing so that a lasting mixture is ensured and a sound measurement of frost protection is possible.

6 Safety distances
Water pipes: min. 1.5 m
Ducts: min. 1 m
Buildings, walls, area border: min. 1.2 m.
If these minimum distances cannot be observed, the object to be protected has to be insulated accordingly (closed pore insulation) to avoid frost damage.

7 Connection pipe to heating house
It is recommended to join the collector circuits to a shaft (preferably Hoval geothermal heat shaft), so that only two pipes have to be fed to the heating house after that. The geothermal heat shaft must be rainwater-tight and it is essential that it is drained (gravel layer, drainage, ...). The connection pipes are also to be laid in a sand bed.

Configuration of the connection pipe according to applicable standards of the country in question.

The following dimensions are recommended (material PE-HD PN10):

UltraSource® T (8), Thermalia® comfort (8-10), comfort H (7,10): DA 40
UltraSource® T (13,17), Thermalia® comfort (13,17), twin H (13): DA 50
Thermalia® twin (20,26), twin H (19,22): DA 63
Thermalia® twin (36-42), dual (55), dual H (35,50), dual R (55): DA 75
Thermalia® dual (70,85), dual H (50-90), dual R (70,85): DA 90

8 Commissioning
Commissioning of the heat pump is carried out exclusively by Hoval customer service. The heat pump must be electrically connected and the system filled, well flushed and vented. After commissioning, the customer receives a completion certificate.

1 Explanation
To use the geothermal heat, depth probes (preferably 2-circuit probes) are inserted into the ground to a max. depth of 200 m per bore hole. The collector pipes contain a mixture of water and frost protection agent which is circulated by means of a circulating pump. The energy is transferred to an intermediate heat exchanger, which is where the evaporation takes place.
A letter of approval is required from the authorities to lay a heat pump unit with depth probe.

2 Dimensioning of the deep borehole
The quick guide offers reference values for planning and is not intended as a substitute for geological evaluation.
In the case of special applications which do not increase the output of the heat pump (e.g. outdoor swimming pool), the heat source must be enlarged if the annual runtime is extended (greater annual extraction).

3 Laying/drilling depth
The boreholes are made according to calculation and the probes are inserted by the drilling company. If the subsoil actually hit differs from the projected geology, the depth of the borehole(s) must be adjusted to the new situation!
The connection pipes are laid in trenches at a depth of approx. 1.2 m.

4 Laying/drilling spacing
Centre of deep borehole to centre of deep borehole min. 7 m (depending on the approval from the authorities, other distances can be stipulated). Larger distances between the boreholes reduce the additional allowance made for the total borehole metres.
The connection pipes are to be laid in a sand bed with a minimum distance of 50 cm.

5 Laying/drilling area
The surface must be undeveloped and even, and have only a minimal slope. The drilling points must be accessible with a drilling device (approx. 20 t in weight, approx. 3 m wide). The position of the depth probes and connection pipes is to be drawn on a plan, which remains on the heat pump.

6 Bringing in the depth probes
The drilling company makes the borehole, inserts and backfills the probe and performs a pressure test. Ensure that the probe is properly and sufficiently backfilled from bottom to top.
It is recommended to use 2-circuit (duplex) probes. Water and electricity are needed to make the borehole. The drilling mud must be capable of being stored at the borehole (skip or container). Buildings should possibly be protected against splash water from the drilling.
If several boreholes are required, ensure that the boreholes all have the same depth and that the connection pipes are all the same length in order to ensure equal rock pressure conditions. Otherwise, flow rate indicators have to be installed. It is recommended to lay warning tapes approx. 50 cm above the connection pipes.
The brine circuit is to be filled with a water-frost protection agent mixture with a frost protection of -15 °C (when using the 33 % in vol. Hoval frost protection concentrate). Practical guide: Use water that has been preheated to 30 °C when mixing so that a lasting mixture is ensured and a sound measurement of frost protection is possible.

7 Safety distances
Between the boreholes: min. 7 m.
To water pipes, ducts, buildings, walls and area borders: min. 3 m.
Depending on the approval from the authorities, other distances can be stipulated.

8 Connection pipe to heating house
It is recommended to join the collector circuits to a shaft (preferably Hoval geothermal heat shaft), so that only two pipes have to be fed to the heating house. The geothermal heat shaft must be rainwater-tight and it is essential that it is drained (gravel layer, drainage, ...). The connection pipes are also to be laid in a sand bed.

Configuration of the connection pipe according to applicable standards of the country in question.

The following dimensions are recommended (material PE-HD PN 10):

UltraSource® T (8), Thermalia® comfort (8-10), comfort H (7,10): DA 40
UltraSource® T (13,17), Thermalia® comfort (13,17), twin H (13): DA 50
Thermalia® twin (20,26), twin H (19,22): DA 63
Thermalia® twin (36-42), dual (55), dual H (35,50), dual R (55): DA 75
Thermalia® dual (70,85), dual H (50-90), dual R (70,85): DA 90

The specified dimensions are sufficient for connection pipes with a length of approx. 25 m (one direction). For longer connection pipes, choose a larger pipe diameter.

9 Curing time
Standard cement-bentonite mixtures for the grouting of the depth probes have a curing time of 28 days. Within this time period, the depth probe cannot be operated yet. Ask the drilling company about this.

10 Commissioning
Commissioning of the heat pump is carried out exclusively by Hoval customer service.
The heat pump must be electrically connected and the system filled, well flushed and vented. After commissioning, the customer receives a completion certificate.

1 Explanation

To use the ground water heat, pumping and injection wells are mounted. A submerged pump pumps the ground water through an intermediate heat exchanger. This intermediate circuit, which is filled with frost protection agent, transfers the energy to a heat exchanger in the heat pump, which is where evaporation takes place. A letter of approval is required from the authorities to mount a water/water heat pump unit.

2 Direct utilisation of ground water (without intermediate circuit)

The design of modern evaporators (brazed plate heat exchangers with very narrow plate spacing for high transfer rates) is such that applications with direct ground water throughflow are not allowed. These evaporators have very narrow flow channels and are extremely sensitive to even very fine dirt particles such as those abundant in ground water. If individual channels become blocked, they can freeze, resulting in leakage. This can cause irreparable damage to the heat pump. Flow monitors and temperature monitoring devices cannot be used, as the deviations are so slight that they are not registered. Upstream fine filters provide only a partial solution to the problem and need frequent cleaning.

Notice
In the case of systems without an intermediate heat exchanger (direct utilisation of ground water), Hoval accepts no liability for any damage caused by soiling or freezing of the evaporator!

3 Indirect utilisation of ground water (with intermediate circuit)

The somewhat lower performance coefficient is more than compensated for by the high operational reliability. Even with indirect use, ground water analysis is essential to allow selection of the appropriate intermediate heat exchanger and in order to identify problems caused by iron or manganese in combination with oxygen. Ideally, a separating heat exchanger in gasketed design should be used. Such heat exchangers can be dismantled for cleaning and have wider plate spacing. The hydraulic **piping** of the system must be carried out according to the selected hydraulic schematic. The intermediate circuit is filled with frost protection agent for frost protection of -15 °C (corresponds to 33 % in vol. Hoval frost protection concentrate). The output of the heat pump can thus be read off for brine +7 °C.

4 Ground water

A pump trial run of at least 3 days must be performed in order to ascertain the effectiveness and in order to “clean” the production well. The minimum permissible temperature of the returned ground water is 5 °C.

For the intermediate heat exchanger, the following limit values must be observed during the entire operating time of the heat pump (groundwater analyses are essential, the water quality can change constantly):

ph-value	7-9
Sulphates	< 100 mg/l
Chlorides	< 50 mg/l
Nitrates	< 100 mg/l
Phosphates	< 2 mg/l
Free chlorides	< 0.5 mg/l
Free carbonic acid	< 20 mg/l
Ammonia	< 2 mg/l
Iron	< 0.2 mg/l [1]
Manganese	< 0.1 mg/l [1]
Oxygen	< 2 mg/l [1]
Electric conductivity	50-600 µS/cm

[1] If the limit value for iron or manganese is exceeded, the presence of oxygen leads to silting up of the heat exchanger or formation of iron and manganese oxide deposits in the injection well.

5 Wells

Two bored wells are ideally mounted. However, where the geology permits this, the injection well can also be used as an absorbing well. Chiselled wells are to be avoided. The injection well should be at least 10 to 15 m away from the ground water flow (depending on the ground water situation, greater distances may be necessary).

6 Connection pipe

The supply and drainage pipes must be laid so that they are protected against frost at a minimum depth of 1.5 m. Ensure that there is a slight slope to the well.
From the production well, a feed pipe is to be laid for the electrical supply pipe of the pump. A backflushable fine filter with a maximum mesh size of 0.5 mm must be placed in the supply pipe, upstream of the heat pump.

A flow monitor is to be installed in the drainage pipe, upstream from the heat pump, to protect the heat pump (observe the installation instructions). After the flow monitor, a throttle valve is to be installed to adjust the flow rate. The connection pipes are also to be laid in a sand bed.

The following dimensions are recommended (material PE-HD PN 10):

UltraSource® T (8), Thermalia® comfort (8-10), comfort H (7,10): DA 40
UltraSource® T (13,17), Thermalia® comfort (13,17), twin H (13): DA 50
Thermalia® twin (20,26), twin H (19,22): DA 6
Thermalia® twin (36-42), dual (55), dual H (35,50), dual R (55): DA 75
Thermalia® dual (70,85), dual H (50-90), dual R (70,85): DA 90

The specified dimensions are sufficient for connection pipes with a length of approx. 25 m (one direction). For longer connection pipes, choose a larger pipe diameter.

7 Design of the well pump

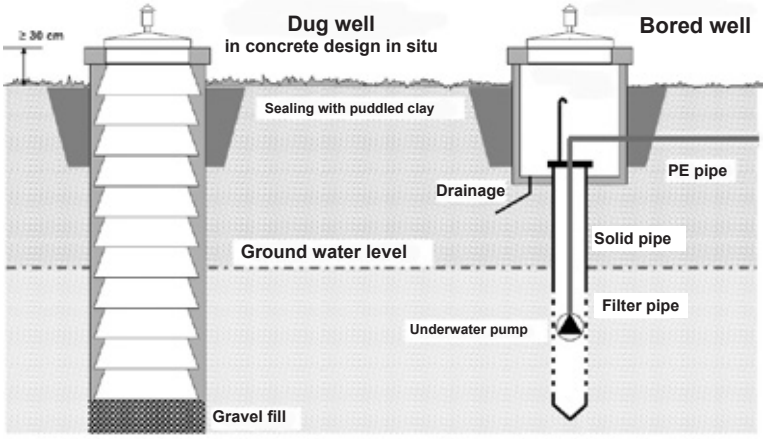
$$m_W = \frac{(Q_K \times 3600)}{(c \times \Delta T)} \quad [kg/h]$$

m_W = mass flow [kg/h] (corresponds approx. to a water flow rate [l/h])
Q_K = refrigerating capacity of the heat pump = heat output – electrical output [kW]
c = specific thermal capacity [kJ/kg.K] (c = 4.187 kJ/kg.K)
ΔT = temperature difference [K] (cooling down of the ground water)
3600 = conversion factor (1 kWh = 3600 kJ)

Rule of thumb: 200 l/h per kW heat pump heat output with a temperature difference of 4 K. Underwater pumps with an integrated non-return flap must be used.

8 Commissioning

Commissioning of the heat pump is carried out exclusively by Hoval customer service. The heat pump must be electrically connected and the system filled, well flushed and vented. After commissioning, the customer receives a commissioning report.



Active/passive cooling

- The low temperature can be output into the room using various systems
- Structural conditions (underfloor heating) and requirements on the room air status (dehumidification, room air temperature) must be taken into account when selecting the system
- It is a good idea to plan a separate cooling circuit for cooling. It can, for example, be combined with a cooling ceiling or a ventilation system
- For lower comfort requirements where a cooling effect suffices, heating via underfloor heating or partial cooling via fan convectors is also possible
- Special thermostatic valves are required that are suitable for heating and cooling operations. Standard thermostatic valves for heating systems close at low room temperatures

Cooling via panel heating

- In panel cooling, the surfaces enclosing the room (ceilings, floors or walls) are cooled by the following systems:
  - Underfloor heating, wall heating
  - Cooling ceilings
  - Concrete core temperature control
- In all panel cooling systems, the temperature at the surfaces is not allowed to fall below the dewpoint temperature so that condensation will not form
- The fixed value of 18 °C is not allowed to be reduced by the user
- Dehumidification of the room air is not possible with panel cooling systems, and must be performed using additional systems if required
- If the room air is not dehumidified, the relative humidity will increase as the room temperature falls – which can lead to a reduction in comfort
- A plate heat exchanger is installed in the brine circuit (passive cooling)
- The minimum cooling temperature (dewpoint temperature) is regulated by a 3-way mixer valve
- A dewpoint monitor is required so as to avoid condensation formation (dropping below the dewpoint) on the cooling surfaces.

Cooling by fan convectors

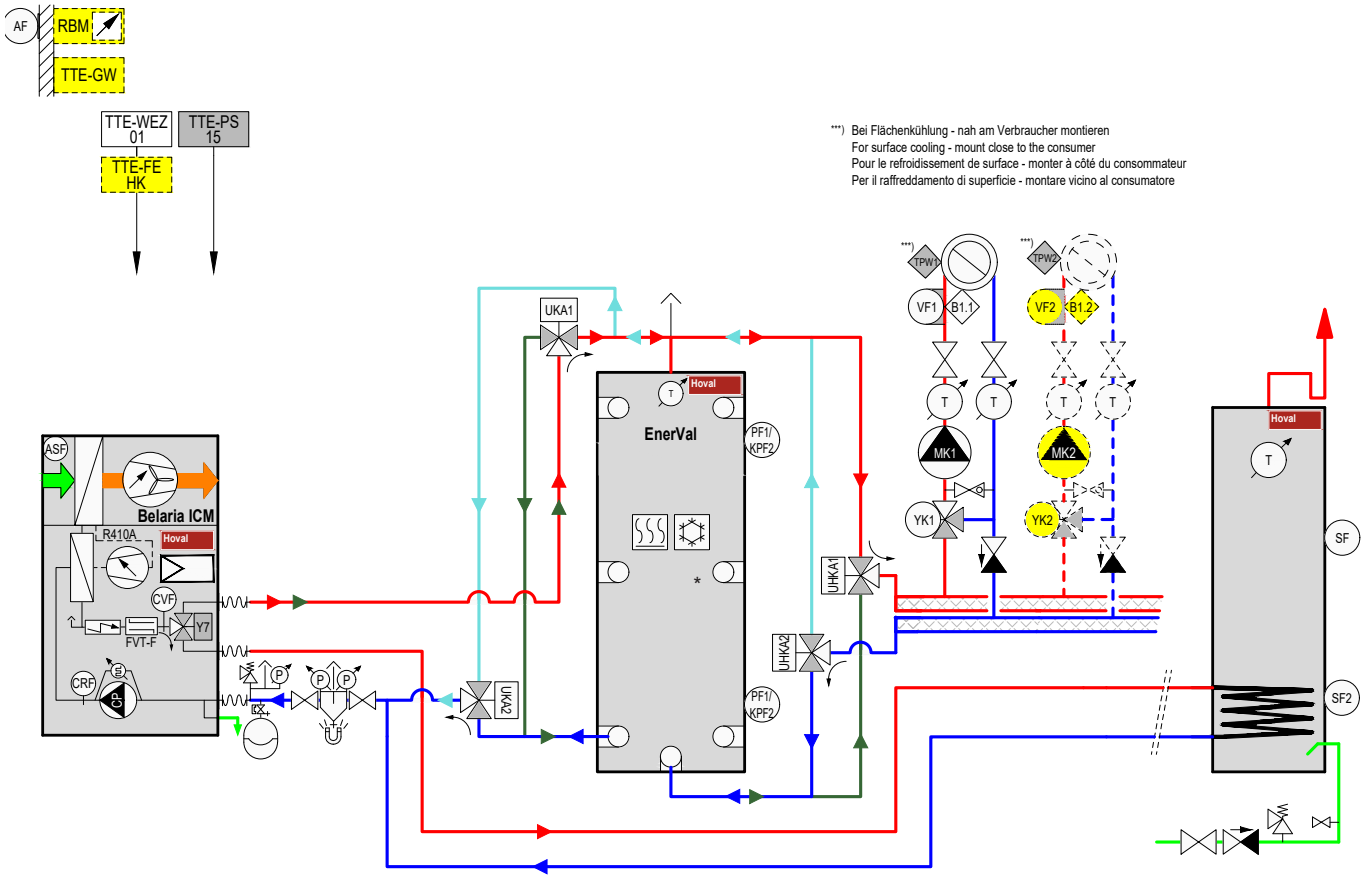
- Recommended use only with active cooling
- The heat pump must be equipped with a flow monitor
- Fan convectors can cool and dehumidify the room air. This increases the comfort level
- In fan convectors, cold water flows in the cooling circuit at a temperature below the dewpoint. The resulting condensation must be drained away
- The connection pipes to the fan convector must be insulated to prevent vapour diffusion and avoid any condensation forming on them

Pipe systems

- Materials resistant to corrosion must be used, such as plastic, chromium steel or a steel that has been treated to resist corrosion
- Galvanised pipes or fittings are not allowed to be used
- In the building, the network of pipes including storage tanks and fittings must be insulated to prevent vapour diffusion and avoid any condensation forming

Examples

Active cooling
Hydraulic schematic BBADE070



Notice
The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.

Example Cooling

Active cooling

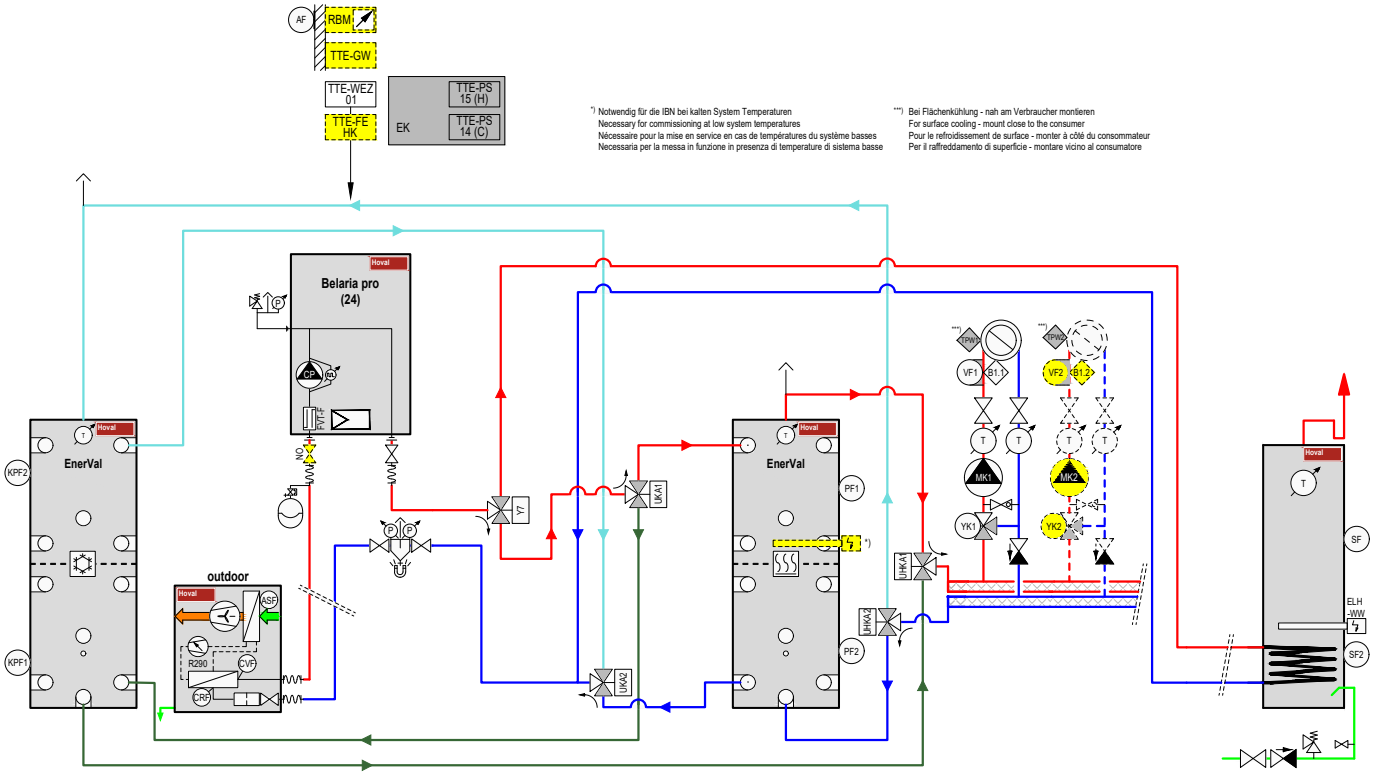
The cooling energy is produced actively with the heat pump for the purpose of cooling. To achieve this, process reversal is carried out in cooling operation. In this case, the heat utilisation side (condenser) becomes the heat absorption side (evaporator). In contrast to passive cooling, the compressor energy must be produced additionally. Cooling/heating operation cannot take place simultaneously. To ensure that the heat pump does not receive too many on/off switching and switchover commands to water heating, we recommend the use of a cooling buffer tank in every case. Depending on the system concept, the heating storage tank can also be used as a cooling storage tank.

General notes on cooling

- Cooling operation must always be monitored. If the room temperature is cooled in an unlimited manner, condensation will form. This, in turn, can damage components. We recommend monitoring the flow temperature in combination with the moisture (dewpoint limit thermostat)
- It is of advantage to plan a separate cooling circuit for cooling. It can, for example, be combined with a cooling ceiling or a ventilation system. For lower comfort requirements where a cooling effect suffices, heating via underfloor heating or partial cooling via fan convectors is also possible
- The water flow must be guaranteed, otherwise no cooling can take place. In case of cooling via the heating surfaces, individual thermostatic controls must be used, which can be switched to cooling mode. Otherwise the valves are closed in the summer and cooling cannot take place

Planning

- Hydraulic integration is ideally via a cooling buffer
- A mixer is required for adjustment of the cooling load of the rooms to the outdoor temperature
- To prevent the formation of condensation, the buffer and all brine and cold water pipes must be rendered vapour-impermeable and thermally insulated in accordance with recognised engineering practices
- Cooling mode is switched on or off manually
- To protect against frost damage in the condenser, it is mandatory to install a flow monitor in the pump circuit (see schematic)



Notice
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Example Cooling

Passive cooling via geothermal probes

Increasingly, at our latitudes, cooling of living areas is offered with the geothermal probe via the panel heating (underfloor or wall heating). The following instructions should be followed for careful planning and also to ensure that the user is fully aware of the limitations of this equipment technology, and operates the system correctly.

Planning

- The dewpoint in the floor or wall must not be undershot at any time
- This is achieved by a fixed value regulation of the flow temperature
- The fixed value must be set high enough to ensure that the dewpoint is not undershot
- The flow temperature setpoint is limited to min. 18 °C
- The cooling must be switched on and off manually

The following must be observed for systems with cooling by floor or wall surfaces:

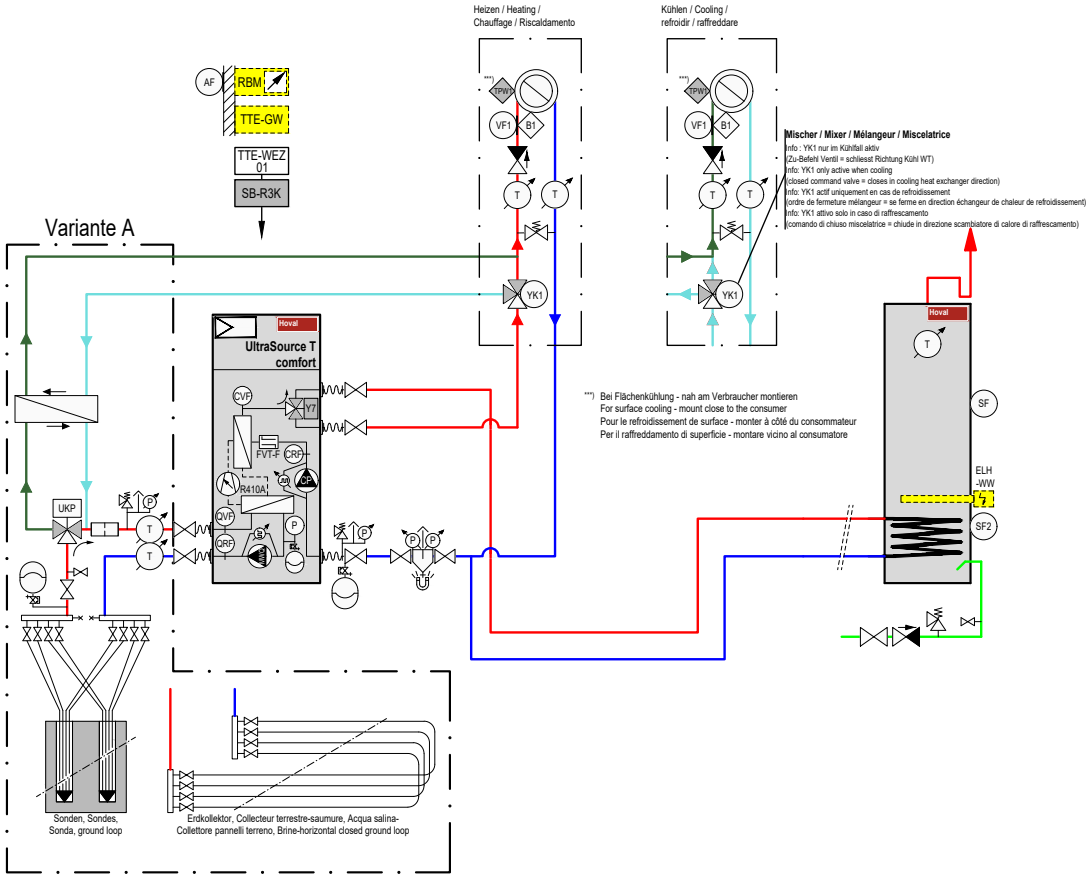
- The cold remains largely on the floor
- This temperature distribution can be perceived as uncomfortable: the occupant has cold feet and a warm head
- The temperature difference between the cooling surface and the air is very small
- No guaranteed cooling capacity can be specified
- Like panel heating, panel cooling also responds slowly
- No condensate is discharged; thus the relative humidity in the room increases
- The lower room temperature combined with the high relative humidity scarcely improves comfort. A humid climate is created
- The minimum limit of 18 °C is not allowed to be reduced by the user

Note the following in comparison with a small air conditioner:

- The energy savings compared to the air conditioner are small
- An air conditioner dehumidifies the air; a humid climate is not created
- An air conditioner delivers a cooling effect rapidly after being switched on
- The costs of an air conditioner are comparatively low

Comparison with other cooling systems:

Surface cooling systems are also used in some cases for cooling office buildings. However, these are usually ceiling cooling systems in conjunction with ventilation. So it is a combination of cooling by radiation (ceiling) and bringing in cool air (with dehumidification). This convenient system technology is usually too complicated and expensive for residential use. Ventilation convectors with condensate drip tray represent another option for air conditioning. Cooled and dehumidified air is introduced at certain places via the convectors (there should be no draughts). In this case, a reversible heat pump that can provide active cooling can also be used.



Notice

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Smart Grid (PV function)

Load management with heat pumps

Heat pumps are currently the most efficient method of storing electricity from volatile generation (electricity from renewable sources such as: wind power, photovoltaic systems or even from combined heat and power).
Smart Grid in this context refers to an intelligent power system.
In contrast to earlier electricity connections that only operate in one direction, the Smart Grid features many distributed electricity generation and consumption systems.
It is obvious that it makes most sense to consume the electricity close to where it is generated. This reduces the grid system load and the public grid system predominantly functions as a balancing mechanism.

The following conditions must be met by the system for efficient and convenient operation:
- Smart meter electricity tariff or the building's own PV system/small wind turbine with Smart Grid-capable inverter or PV load manager (own electricity consumption)
- Heat pump
- TopTronic® E
- Sufficiently large buffer storage tank
- Mixer circuit
- Possibly additional electrical heating

The heat pump is switched on and off or controlled depending on atmospheric conditions. Moreover, it is switched on when a particular green electricity surplus is reached and charges the buffer storage tank and any calorifiers to a higher temperature.
At times when no green electricity is available any longer, the heating is supplied from the charged buffer storage tank. The heat pump needs to be operated less frequently during periods when no or only a little internal current is being generated.

SG Ready standard:
This defines the following 4 functions depending on the PV surplus:
- Normal operation (no influence)
- Heat pump inhibit
- Preferential operation (increased operation)
- Forced acceptance (max. operation)

This is implemented using 2 digital inputs on the TopTronic® E. A 4-core signal cable from the inverter/PV load manager or from the Smart Meter to the heat pump is required for this. The information must be provided potential-free.

0-10 V control:
An on-site energy manager provides a 0-10 V signal which is dependent on the PV surplus. Preferential operation (increased operation) and forced acceptance (max. operation) are activated by adjustable thresholds in the TopTronic® E depending on the available electrical output (PV surplus).

Hoval EnergyManager PV smart:
In addition to the remote monitoring function, the online connection (HovalConnect) of the heat pump system also has the Hoval EnergyManager PV smart integrated in it.
The Hoval EnergyManager PV smart operates with the solar radiation indicated in the weather forecast, and acts either on the preferential operation (increased operation) or forced acceptance (max. operation).

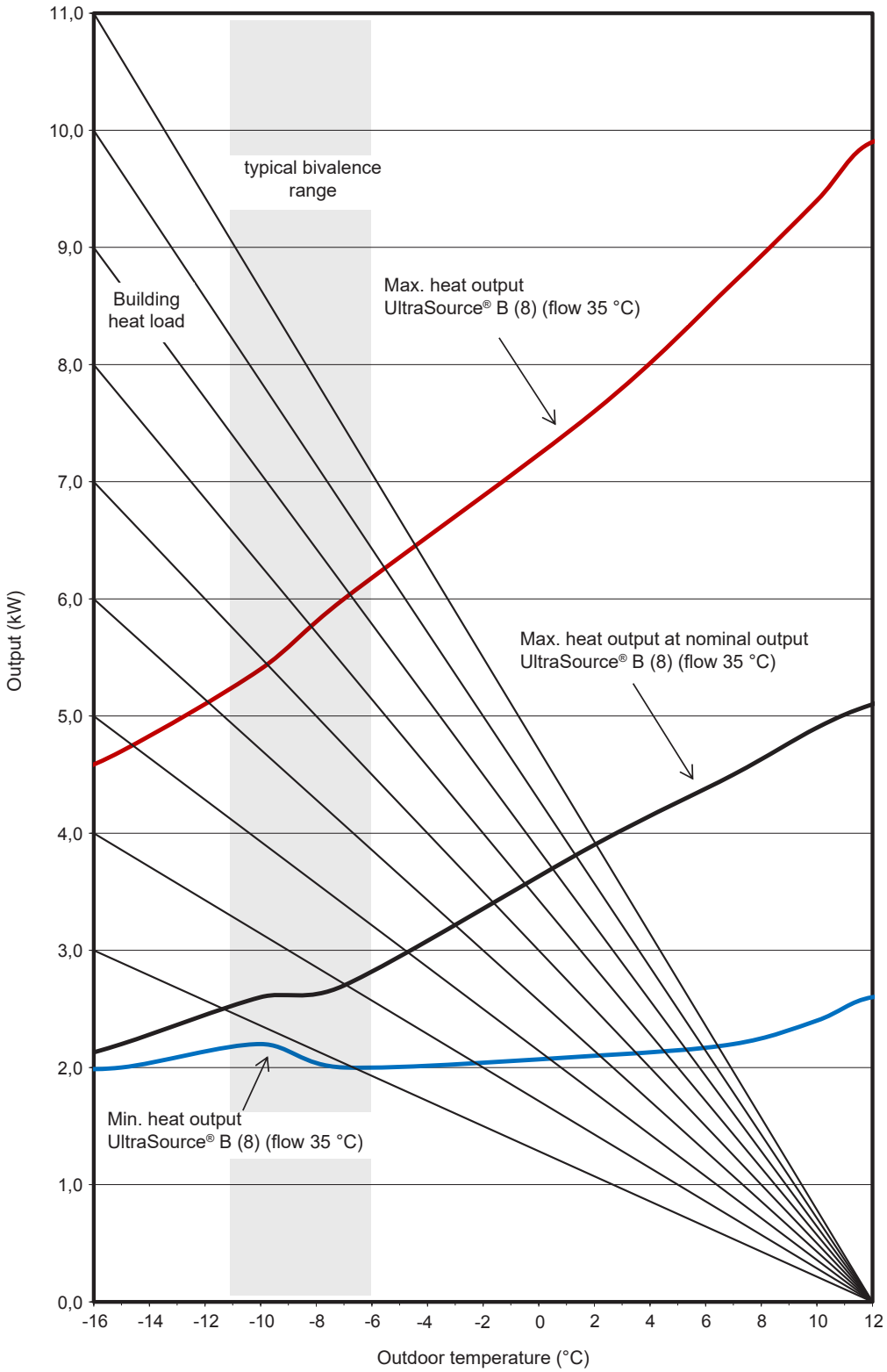
Hoval EnergyManager PV pro:
The EnergyManager PV pro fulfils all the criteria listed above.
It is expected to be available starting from July 2023.
The Hoval EnergyManager PV pro reads out the current PV output via the inverter using Modbus (TCP or RTU). The PV surplus is determined from the current PV output using an M-Bus electricity meter at the feed-in point. Based on this, the current electrical power consumption of the heat pump is constantly adapted to the PV surplus.
The PV surplus can be consumed in a controlled manner as a result. Other consumers such as electric heating elements, e-mobility or household appliances can be integrated by setting priorities.

Dimensions of the UltraSource® B comfort C, UltraSource® B compact C air/water heat pump wiht panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C and UltraSource® B compact C at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

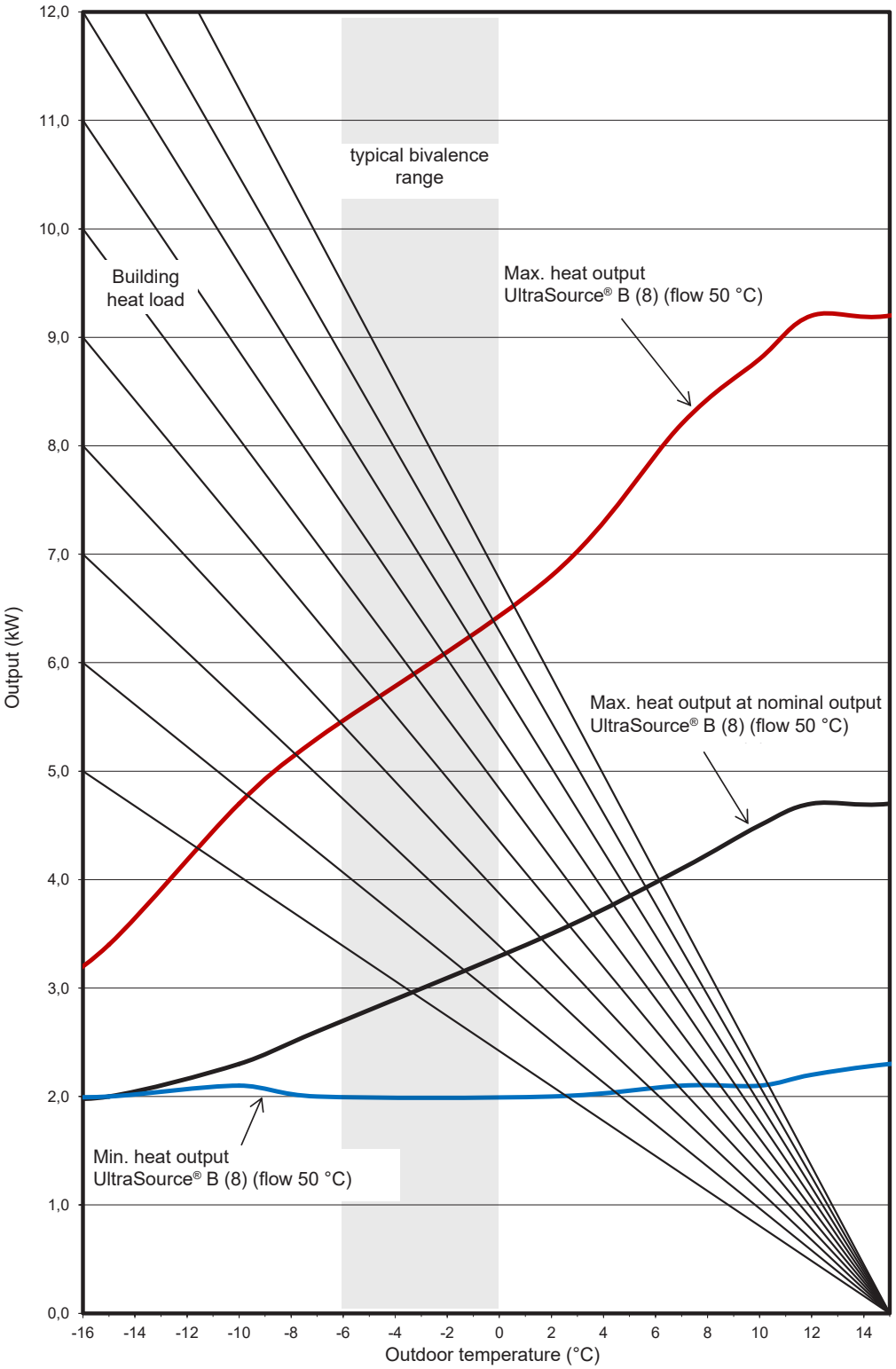


Dimensions of the UltraSource® B comfort C, UltraSource® B compact C air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C and UltraSource® B compact C at a flow temperature of 50 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.

The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.

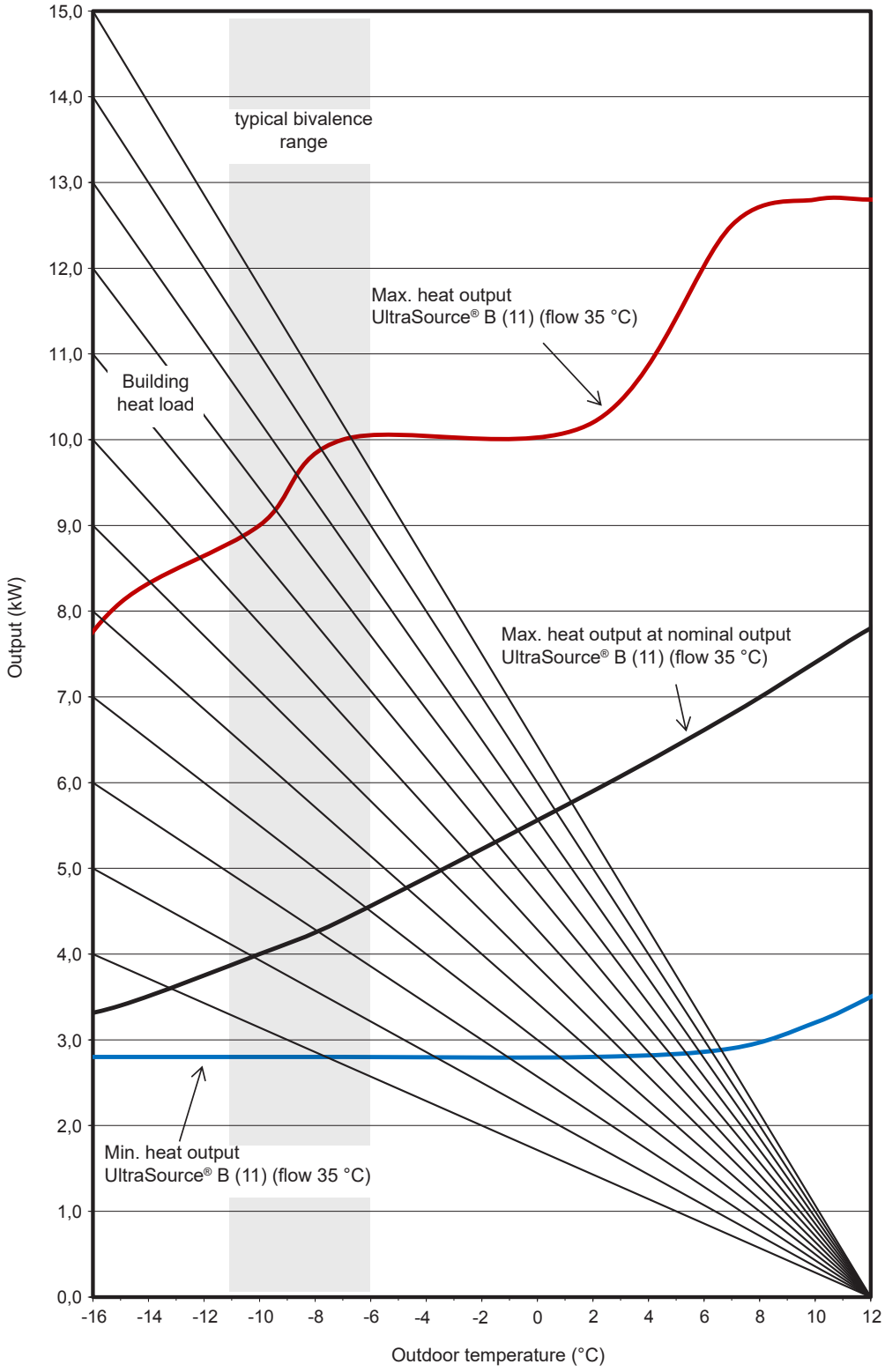


Dimensions of the UltraSource® B comfort C, UltraSource® B compact C air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C und UltraSource® B compact C at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

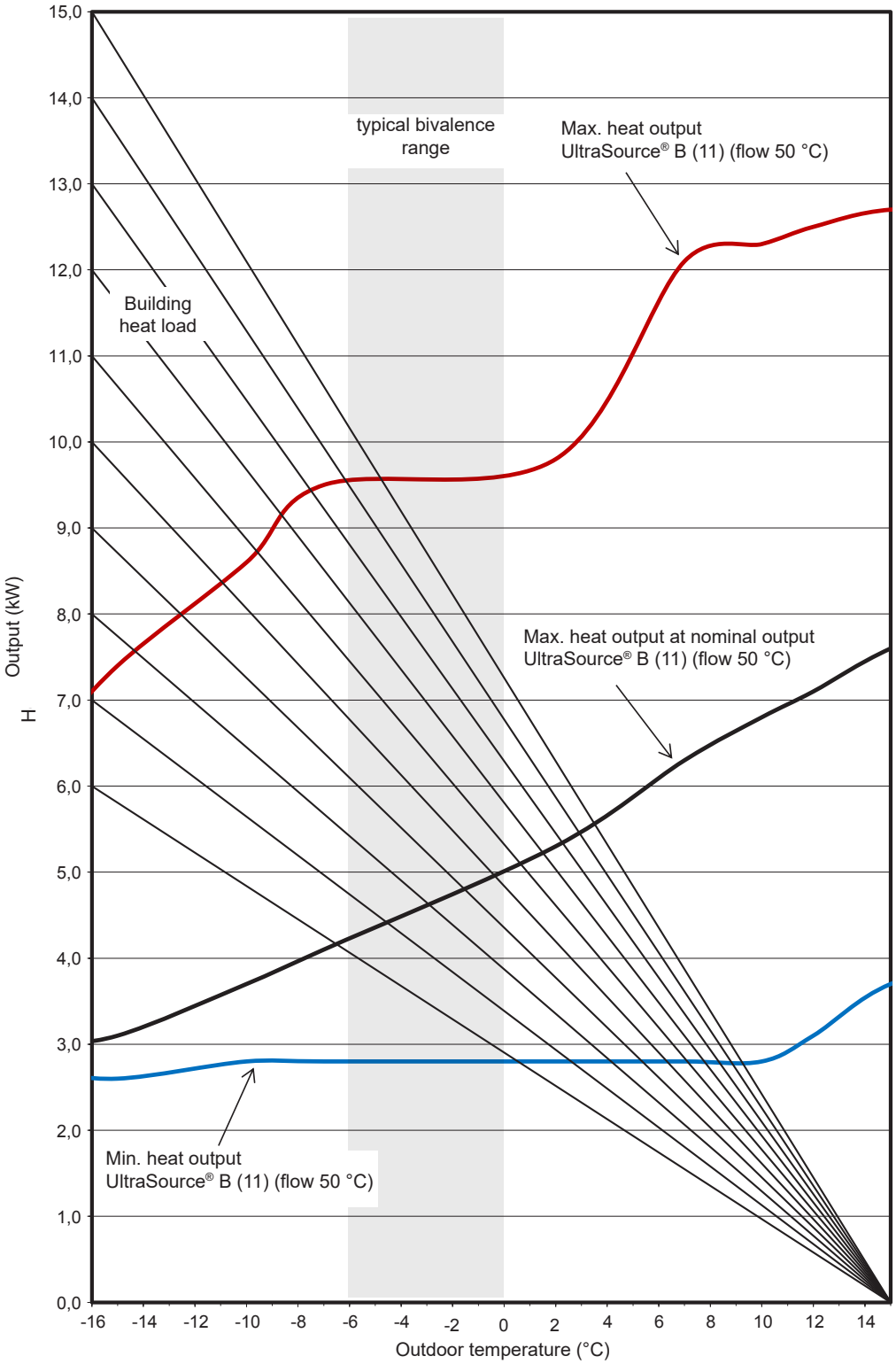


Dimensions of the UltraSource® B comfort C, UltraSource® B compact C with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C und UltraSource® B compact C at a flow temperature of 50 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.

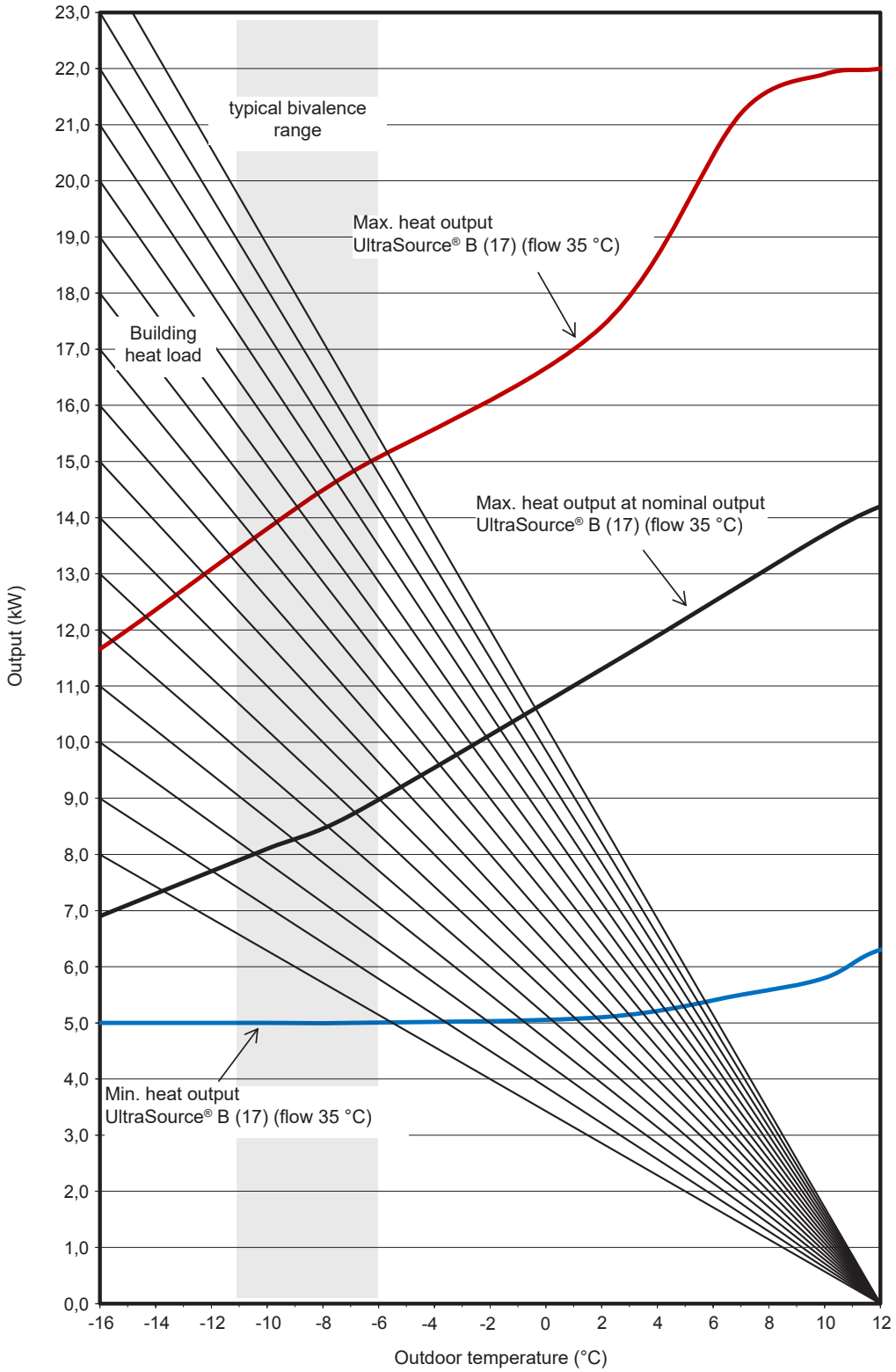
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.



Dimensions of the UltraSource® B comfort C air/water heat pump with panel heating
Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

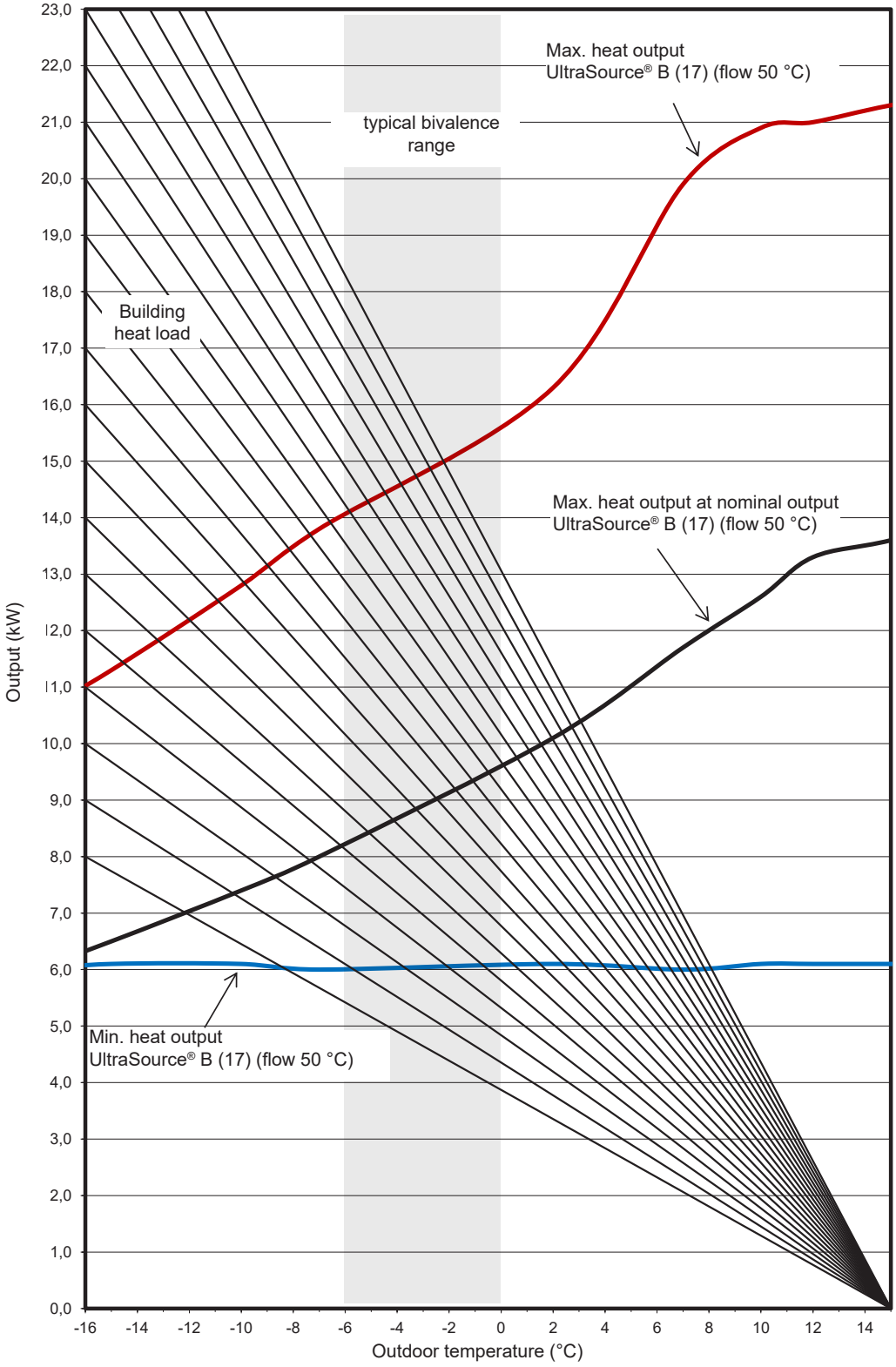


Dimensions of the UltraSource® B comfort C with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the UltraSource® B comfort C at a flow temperature of 50 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.

The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.

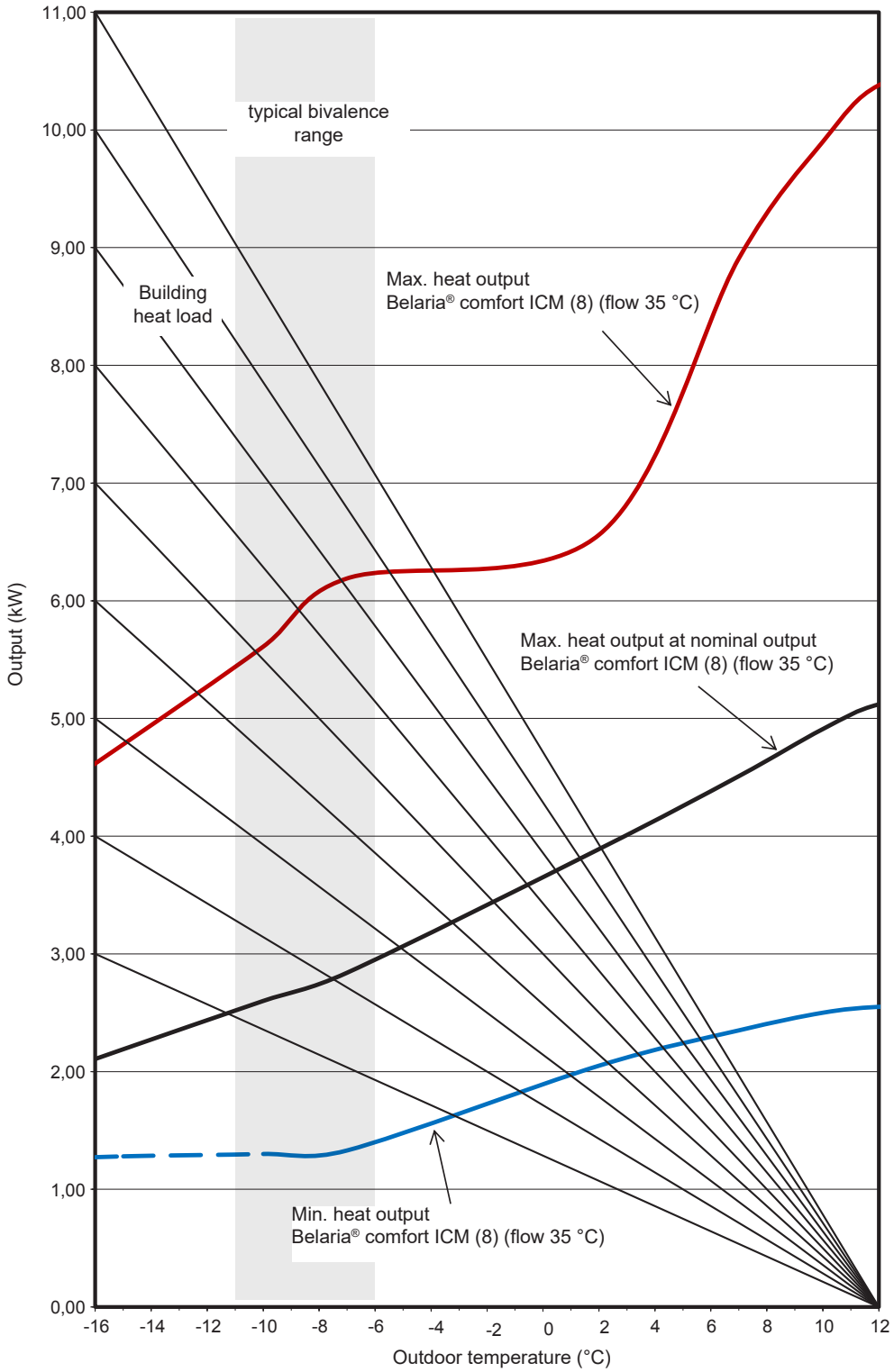


Dimensions of the Belaria® comfort ICM (8) air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® comfort ICM (8) at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

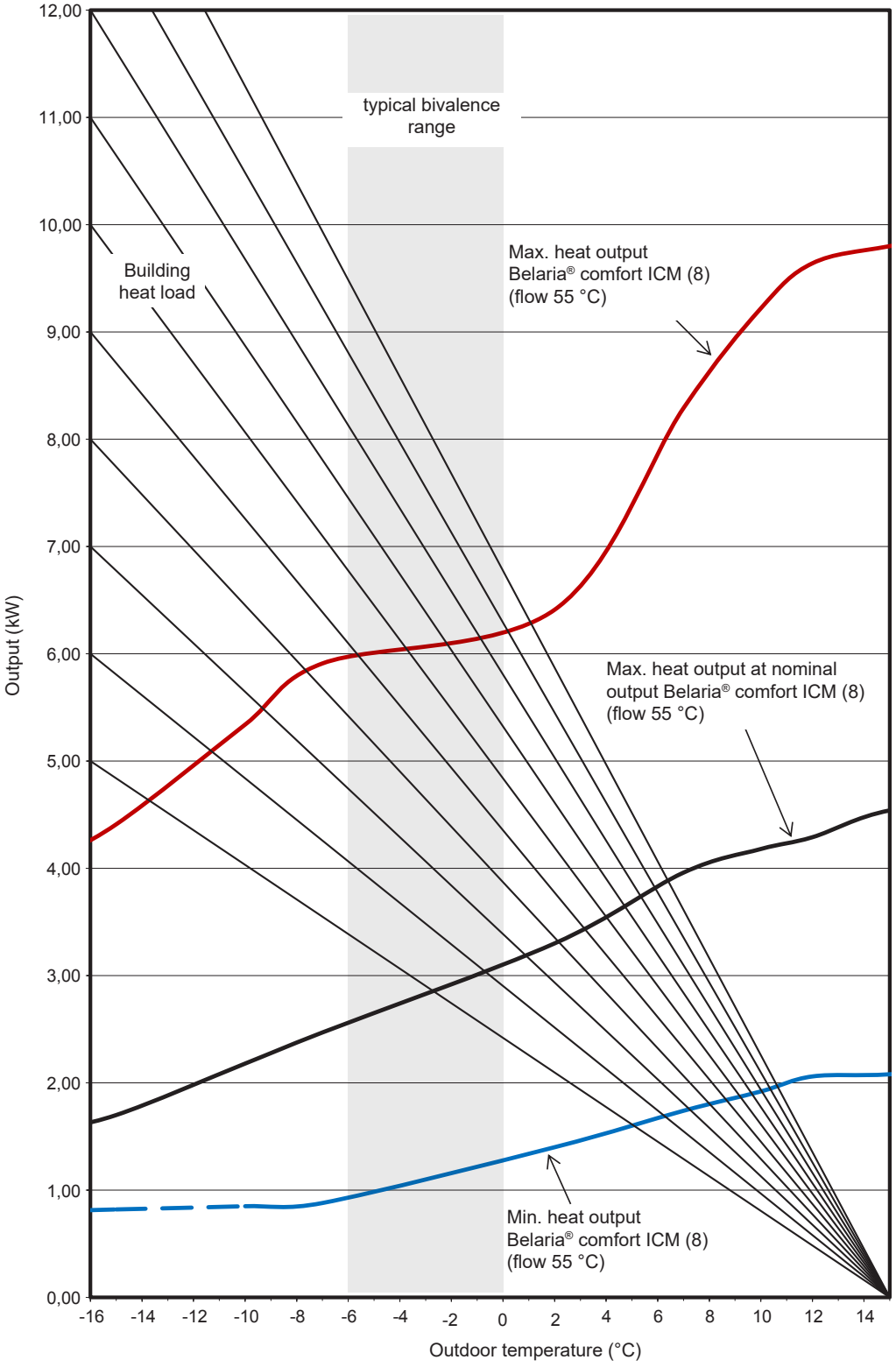


Dimensions of the Belaria® comfort ICM (8) with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® comfort ICM (8) at a flow temperature of 55 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.

The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.

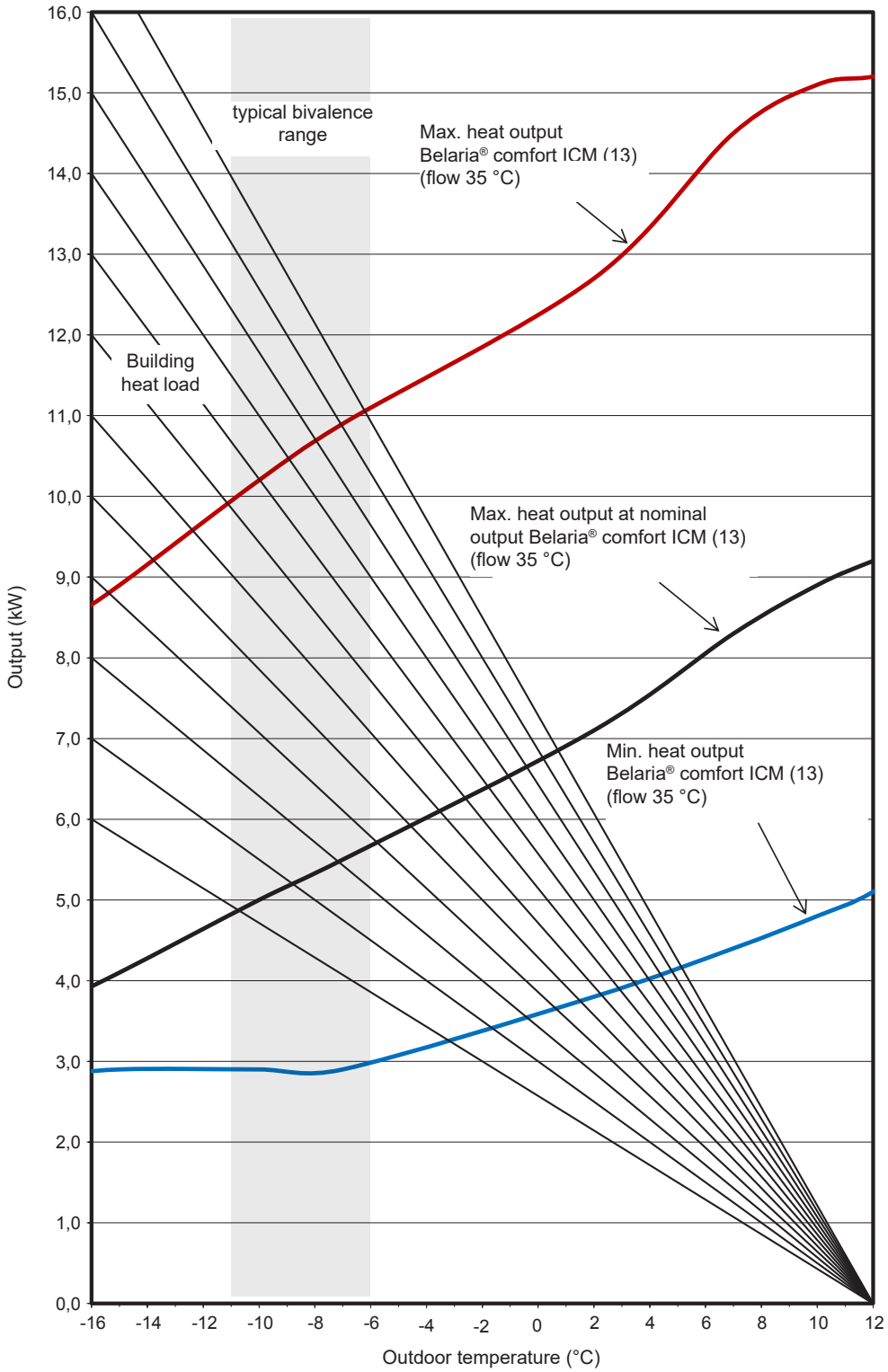


Dimensions of the Belaria® comfort ICM (13) air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® comfort ICM (13) at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

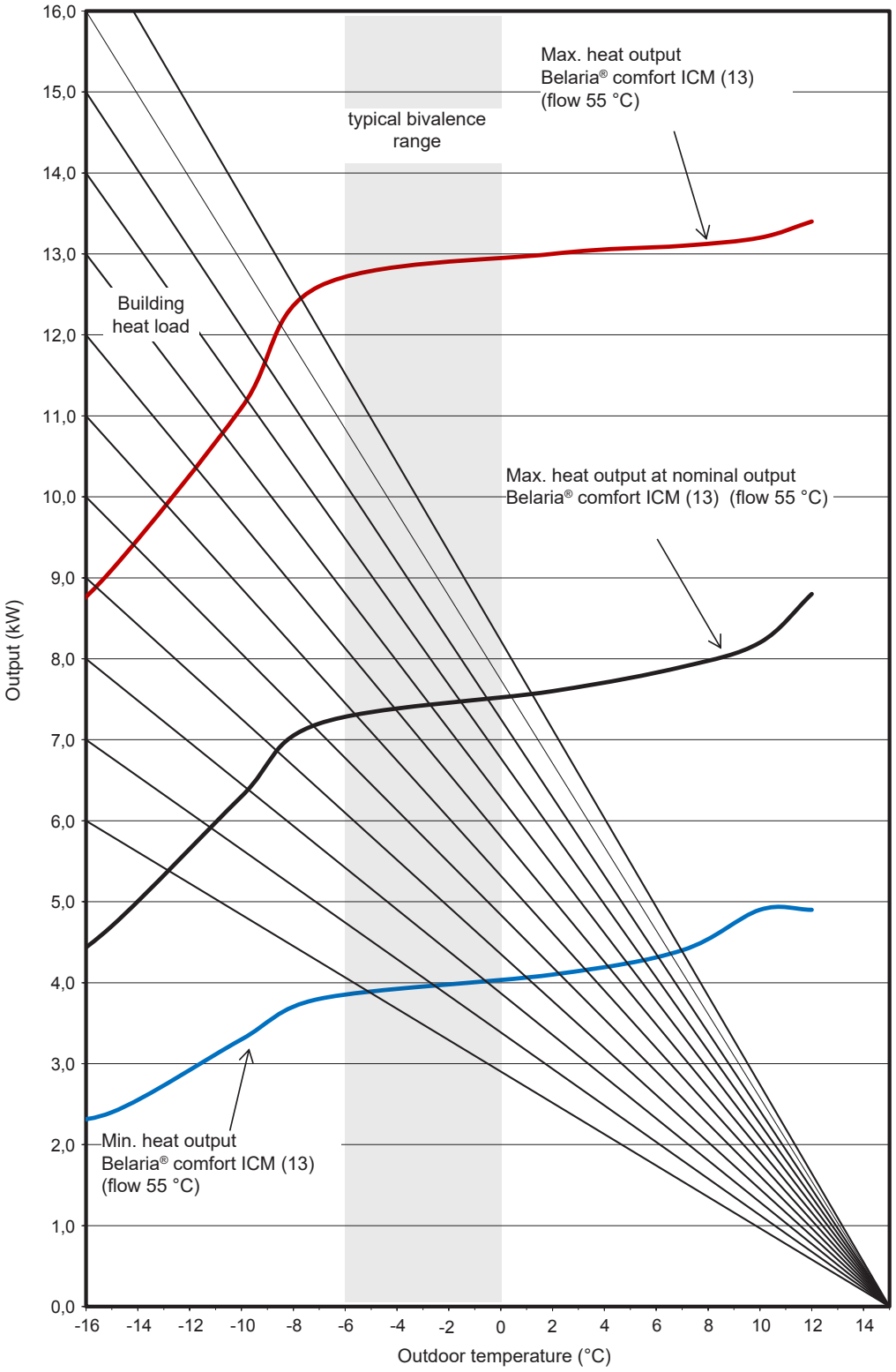


Dimensions of the Belaria® comfort ICM (13) with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® comfort ICM (13) at a flow temperature of 55 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.

The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.

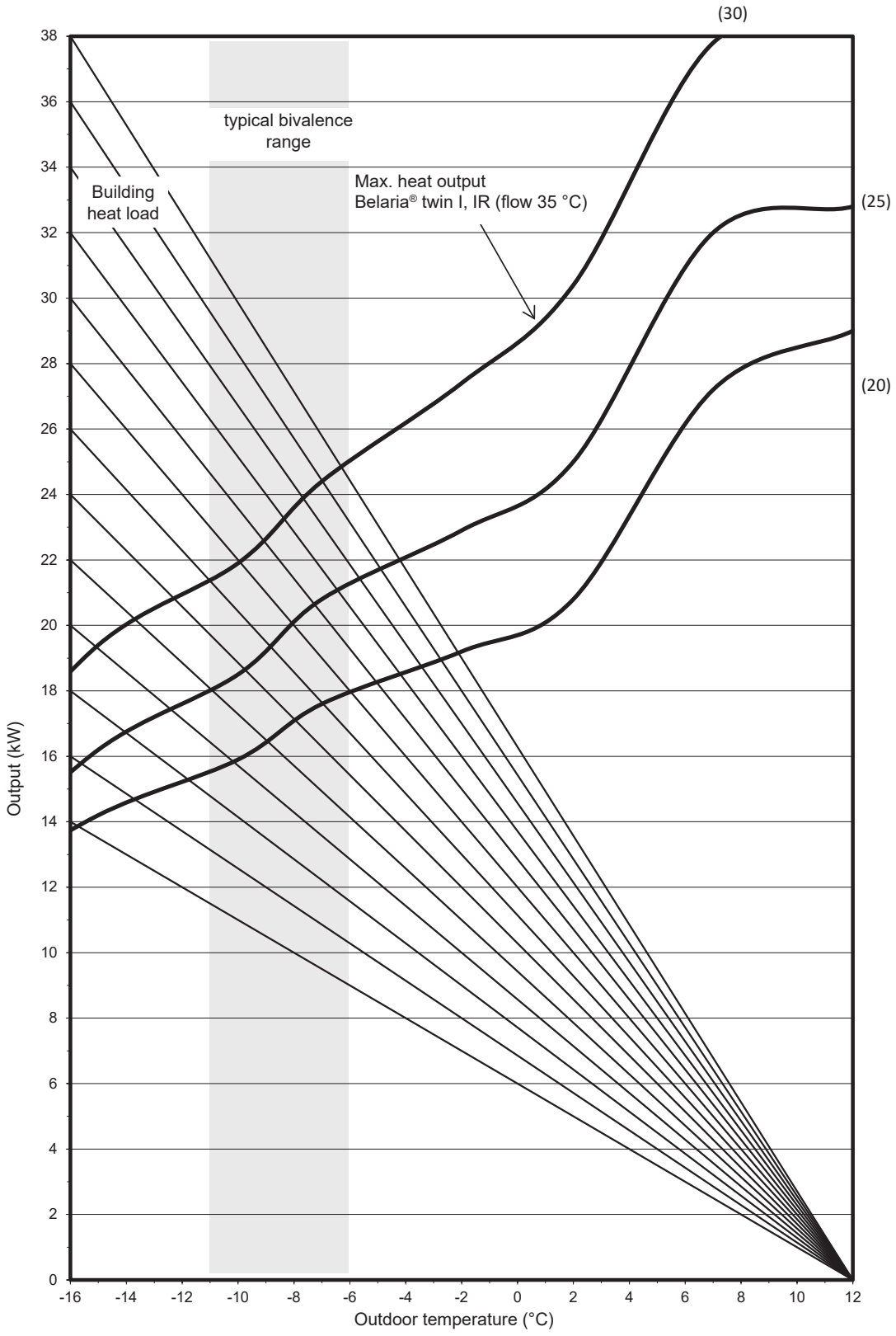


Dimensions of the Belaria® twin I, Belaria® twin IR air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® twin I, Belaria® twin IR at a flow temperature of 35 °C.

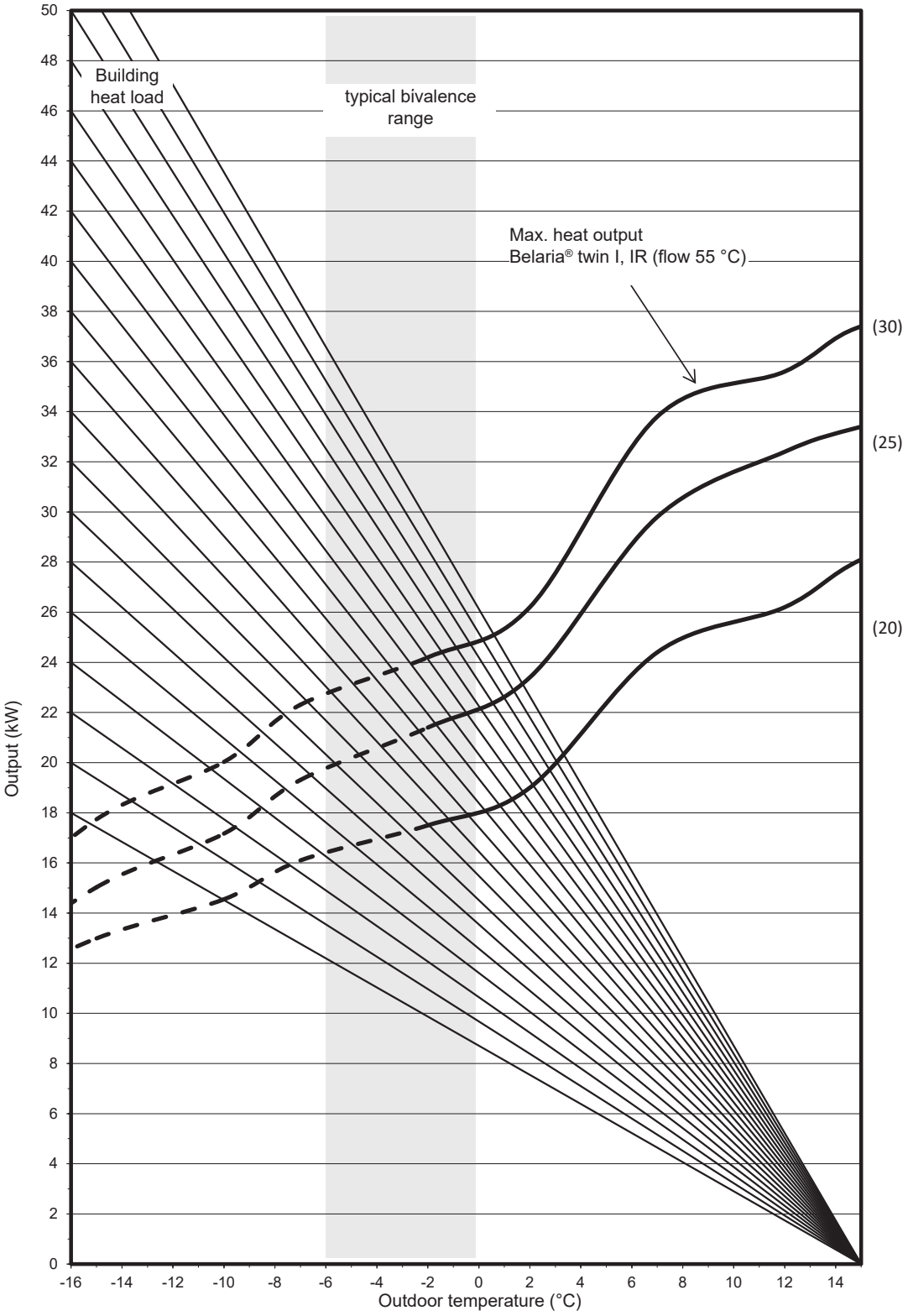
Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.



Dimensions of the Belaria® twin I, Belaria® twin IR air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® twin I, Belaria® twin IR at a flow temperature of 55 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.
In the area of the dotted line, a flow temperature of 50 °C can no longer be achieved by the heat pump.

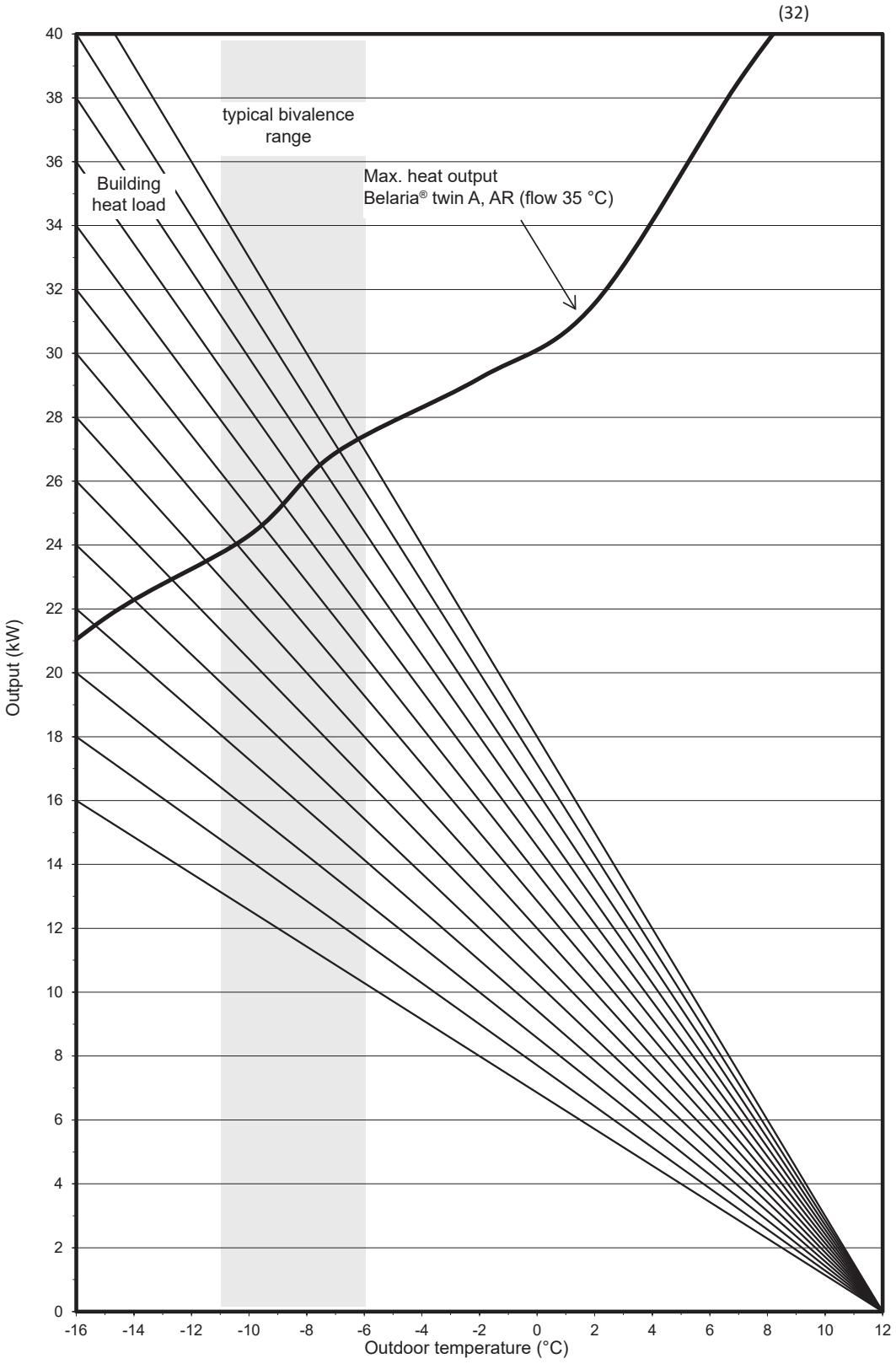


Dimensions of the Belaria® twin A, Belaria® twin AR air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® twin A, Belaria® twin AR at a flow temperature of 35 °C.

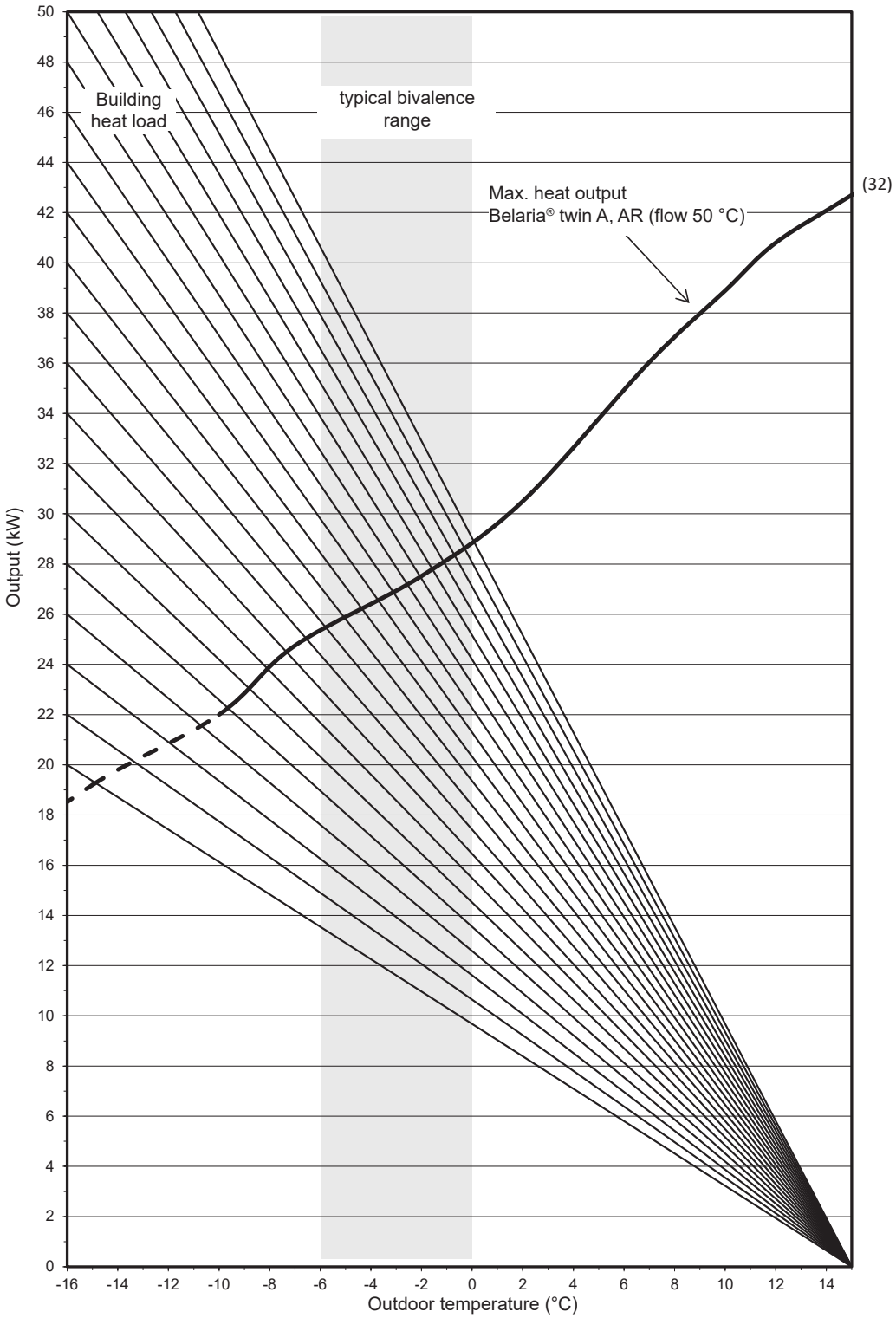
Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.



Dimensions of the Belaria® twin A, Belaria® twin AR air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® twin A, Belaria® twin AR at a flow temperature of 50 °C.
In such a system, the balance point usually lies in the grey shaded area between 0 °C and -6 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey shaded bivalence range.
In the area of the dotted line, a flow temperature of 50 °C can no longer be achieved by the heat pump.

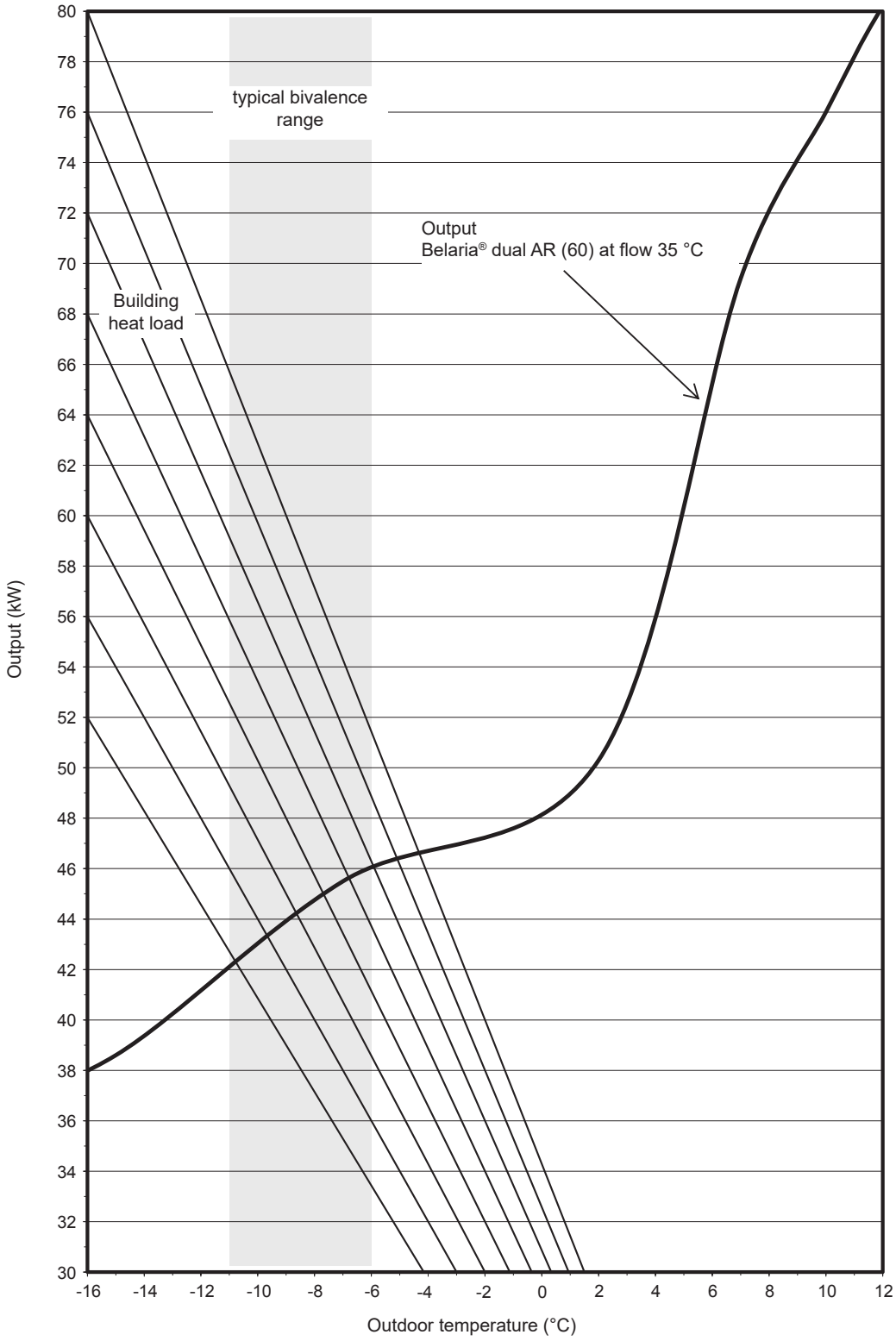


Dimensions of the Belaria® dual AR air/water heat pump with panel heating

Example:
New building with panel heating.
Operating mode: single energy source

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® dual AR at a flow temperature of 35 °C.

Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required output of the additional heating.

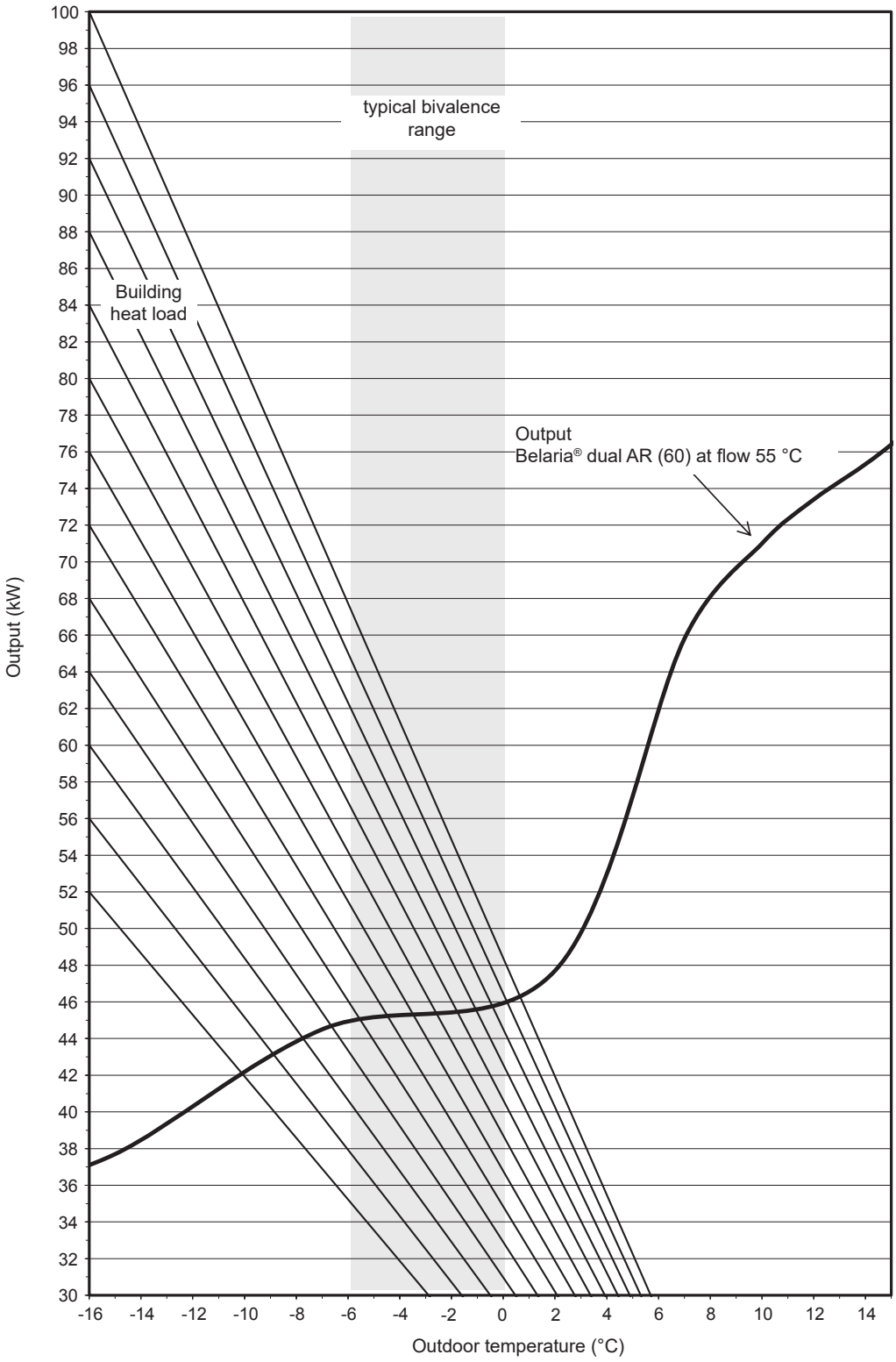


Dimensions of the Belaria® dual AR air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
Operating mode:
Bivalent alternative or bivalent parallel

The diagram shows simplified representations of the heating requirement for the building (building characteristic curve) for a standard outdoor temperature of -16 °C and the output of the Belaria® dual AR at a flow temperature of 55 °C.
Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between 0 °C and -6 °C outdoor temperature.

The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual coefficient of performance. The alternative heating system must cover the entire building heating load.
Notice: If the heating system requires high flow temperatures, the balance point is usually determined by the maximum achievable flow temperature of the heat pump! This may lie outside the grey bivalence range.



Room heating efficiency values ηs - without controller	Air/water heat pumps			
	35 °C		55 °C	
	ηs		ηs	
	ø	moderate climate	ø	moderate climate
	%	%	%	%
UltraSource® B comfort C (8)	202	261	146	180
UltraSource® B compact C (8/200)	202	261	146	180
UltraSource® B comfort C (11)	176	219	135	175
UltraSource® B compact C (11/200)	176	219	135	175
UltraSource® B comfort C (17)	206	244	152	190
Belaria® comfort ICM (8)	181	236	130	181
Belaria® comfort ICM (13)	180	219	136	175
Belaria® twin I (20)	153	177	111	135
Belaria® twin I (25)	152	177	111	131
Belaria® twin I (30)	150	176	112	133
Belaria® twin IR (20)	155	180	112	137
Belaria® twin IR (25)	153	180	112	132
Belaria® twin IR (30)	151	178	113	134
Belaria® twin A (32)	174	209	129	152
Belaria® twin AR (32)	177	216	131	157
Belaria® dual AR (60)	160	194	125	150

Room heating efficiency values ηs - without controller	Brine/water heat pumps			
	35 °C		55 °C	
	ηs		ηs	
	ø	moderate climate	ø	moderate climate
	%	%	%	%
UltraSource® T comfort (8)	209	226	158	161
UltraSource® T compact (8/200)	209	226	158	161
UltraSource® T comfort (13)	213	224	162	164
UltraSource® T compact (13/200)	213	224	162	164
UltraSource® T comfort (17)	226	233	164	166
Thermalia® comfort (8)	176	165	125	119
Thermalia® comfort (10)	191	183	133	128
Thermalia® comfort (13)	192	186	139	135
Thermalia® comfort (17)	190	186	140	138
Thermalia® comfort H (7)	179	166	134	126
Thermalia® comfort H (10)	188	178	140	133
Thermalia® twin (20)	202	199	138	136
Thermalia® twin (26)	198	197	138	137
Thermalia® twin (36)	206	206	148	148
Thermalia® twin (42)	203	204	135	136
Thermalia® twin H (13)	181	175	127	124
Thermalia® twin H (19)	175	171	132	129
Thermalia® twin H (22)	183	180	133	131
Thermalia® dual (55)	195	198	138	140
Thermalia® dual (70)	193	196	140	142
Thermalia® dual (85)	194	197	142	143
Thermalia® dual (110)	194	197	141	143
Thermalia® dual (140)	193	196	141	143
Thermalia® dual H (35)	177	179	130	132
Thermalia® dual H (50)	182	185	135	136
Thermalia® dual H (70)	182	185	132	133
Thermalia® dual H (90)	178	181	131	132
Thermalia® dual R (55)	195	198	138	140
Thermalia® dual R (70)	193	196	140	142
Thermalia® dual R (85)	194	197	142	143
Thermalia® dual R (110)	194	197	141	143
Thermalia® dual R (140)	193	196	141	143

Room heating efficiency values ηs - without controller	Water/water heat pumps			
	35 °C		55 °C	
	ηs		ηs	
	ø	moderate climate	ø	moderate climate
	%	%	%	%
UltraSource® T comfort (8)	309	333	245	227
UltraSource® T compact (8/200)	309	333	245	227
UltraSource® T comfort (13)	313	318	217	224
UltraSource® T compact (13/200)	313	318	217	224
UltraSource® T comfort (17)	311	316	226	234
Thermalia® comfort (8)	231	218	161	153
Thermalia® comfort (10)	245	234	170	164
Thermalia® comfort (13)	255	248	181	177
Thermalia® comfort (17)	240	236	173	170
Thermalia® comfort H (7)	238	222	177	167
Thermalia® comfort H (10)	249	237	185	177
Thermalia® twin (20)	277	273	183	181
Thermalia® twin (26)	274	272	180	179
Thermalia® twin (36)	270	269	191	191
Thermalia® twin (42)	259	260	176	176
Thermalia® twin H (13)	225	218	170	166
Thermalia® twin H (19)	226	222	172	170
Thermalia® twin H (22)	239	236	178	176
Thermalia® dual (55)	257	261	185	187
Thermalia® dual (70)	249	253	180	182
Thermalia® dual (85)	250	254	181	183
Thermalia® dual (110)	242	245	177	179
Thermalia® dual (140)	245	249	178	180
Thermalia® dual H (35)	254	258	179	181
Thermalia® dual H (50)	246	249	179	181
Thermalia® dual H (70)	245	248	177	179
Thermalia® dual H (90)	240	244	174	176
Thermalia® dual R (55)	257	261	185	187
Thermalia® dual R (70)	249	253	180	182
Thermalia® dual R (85)	250	254	181	183
Thermalia® dual R (110)	242	245	177	179
Thermalia® dual R (140)	245	249	178	180

Belaria® air/water heat pumps

					UltraSource® B comfort C			Belaria® comfort ICM		Belaria® twin I, twin IR			Belaria® twin A, twin AR	Belaria® dual AR
Heat generator type					(8)	(11)	(17)	(8)	(13)	(20)	(25)	(30)	(32)	(60)
Material	Calorifier type			Heating surface [m²]										
Enamel	CombiVal (= CV)	ER	200	0.95	■			■						
			300	1.45	■	■		■						
			400	1.80		■		■	■					
			500	1.90		■	■		■					
			800	3.70			■							
			1000	4.50										
		ESR	200	1.80	■	■		■	■					
			300	2.60	■	■	■	■	■					
			400	3.80		■	■	■	■					
		ESSR	500	5.90		■	■		■	■	■	■		
			800	7.00			■			■	■	■	■	
			1000	9.15						■	■	■	■	
	MultiVal (= MV)	ERR	300	0.80	■			■						
			400	1.00	■			■						
			500	1.30	■	■		■						
		ESRR	500	4.30	■	■	■	■	■					
			800	5.20		■	■		■	■	■			
			1000	6.10		■	■		■	■	■	■		
Stainless steel	CombiVal (= CV)	CR	200	1.28	■	■		■						
			300	1.28	■	■		■						
			500	1.70		■			■					
			800	2.63			■							
			1000	2.63										
		CSR	300	2.56	■	■	■	■	■					
			400	3.40		■	■	■	■					
			500	5.26		■	■		■	■	■			
			800	6.30			■			■	■	■		
			1000	10.00						■	■	■	■	
			1250	10.00							■	■	■	
			1500	11.30							■	■	■	
			2000	12.70										■
	MultiVal (= MV)	CRR	500	1.28	■	■		■						
			800	1.28	■	■		■						
			1000	1.28		■								
		CSRR	500	5.20	■	■	■	■	■	■	■			
			800	7.40		■	■		■	■	■	■	■	
			1000	10.00		■	■		■	■	■	■	■	
			1500	11.30			■			■	■	■	■	
			2000	11.30						■	■	■	■	

The allocation of the calorifiers to the heat pumps is based on the heating surface of the storage tank coil, heat output of the heat pump for domestic hot water charging, maximum duration of domestic hot water charging and other parameters. For this reason, this allocation table only contains standard values.

Notice
The suggested combinations of heat pump with calorifier are a recommendation according to the suitable coil size and duration of domestic hot water charging (120 minutes). It is possible to deviate from the recommended combinations depending on how the customer uses it.

Notice
For higher comfort requirements or a higher hot water requirement, we recommend the storage tank series with larger heating coils: series ESR and ESSR (or CSR).

Thermalia® brine/water heat pumps

Material	Calorifier type			Heating surface [m²]	UltraSource® T comfort (8)	UltraSource® T comfort (13)	UltraSource® T comfort (17)	Thermalia® comfort, comfort H (8)	Thermalia® comfort, comfort H (10)	Thermalia® comfort, comfort H (13)	Thermalia® comfort, comfort H (17)	Thermalia® comfort, comfort H H (7)	Thermalia® comfort, comfort H H (10)	Thermalia® twin, twin H (20)	Thermalia® twin, twin H (26)	Thermalia® twin, twin H (36)	Thermalia® twin, twin H (42)	Thermalia® twin, twin H H (13)	Thermalia® twin, twin H H (19)	Thermalia® twin, twin H H (22)	Thermalia® dual, dual H, dual R (55)	Thermalia® dual, dual H, dual R (70)	Thermalia® dual, dual H, dual R (85)	Thermalia® dual, dual H, dual R (110)	Thermalia® dual, dual H, dual R (140)	Thermalia® dual, dual H, dual R H (35)	Thermalia® dual, dual H, dual R H (50)	Thermalia® dual, dual H, dual R H (70)	Thermalia® dual, dual H, dual R H (90)
Email	CombiVal (= CV)	ER	200	0.95	■	■																							
			300	1.45	■	■	■																						
			400	1.80		■	■											■											
			500	1.90		■	■											■											
			800	3.70			■							■					■	■									
			1000	4.50										■	■														
		ESR	200	1.80	■	■	■											■											
			300	2.60	■	■	■	■										■											
			400	3.80		■	■	■	■			■	■	■				■	■	■									
		ESSR	500	5.90		■	■		■	■	■		■	■	■	■		■	■	■						■			
			800	7.00			■				■			■	■	■	■		■	■						■			
			1000	9.15							■			■	■	■	■				■					■	■		
	MultiVal (= MV)	ERR	300	0.80	■																								
			400	1.00	■	■																							
			500	1.30	■	■	■																						
		ESRR	500	4.30	■	■	■	■	■	■		■	■	■	■			■	■	■									
			800	5.20		■	■		■	■			■	■	■			■	■	■									
			1000	6.10		■	■		■	■	■			■	■	■		■	■	■						■			
Edelstahl	CombiVal (= CV)	CR	200	1.28	■	■	■																						
			300	1.28	■	■	■																						
			500	1.70		■	■											■											
			800	2.63			■																						
			1000	2.63																									
		CSR	300	2.56	■	■	■	■				■						■											
			400	3.40		■	■	■	■				■	■				■	■	■									
			500	5.26		■	■		■	■			■	■	■			■	■	■									
			800	6.30			■				■			■	■	■			■	■						■			
			1000	10.00							■			■	■	■	■				■					■	■		
			1250	10.00											■	■	■				■					■	■		
			1500	11.30												■	■				■	■				■	■		
			2000	12.70													■				■	■					■	■	
	MultiVal (= MV)	CRR	500	1.28	■	■	■																						
			800	1.28	■	■	■																						
			1000	1.28		■	■																						
		CSRR	500	5.20	■	■	■	■	■	■		■	■	■	■			■	■	■									
			800	7.40		■	■		■	■	■		■	■	■	■	■	■	■	■						■			
			1000	10.00		■	■			■	■			■	■	■	■		■	■	■					■	■		
			1500	11.30			■				■			■	■	■	■			■	■					■	■		
			2000	11.30											■	■	■				■					■	■		

The allocation of the calorifiers to the heat pumps is based on the heating surface of the storage tank coil, heat output of the heat pump for domestic hot water charging, maximum duration of domestic hot water charging and other parameters. For this reason, this allocation table only contains standard values.

Notice
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Notice
The suggested combinations of heat pump with calorifier are a recommendation according to the suitable coil size and duration of domestic hot water charging (120 minutes). It is possible to deviate from the recommended combinations depending on how the customer uses it.

Thermalia® water/water heat pumps

Material	Calorifier type		Heating surface [m²]	UltraSource® T comfort (8)	UltraSource® T comfort (13)	UltraSource® T comfort (17)	Thermalia® comfort, comfort H (8)	Thermalia® comfort, comfort H (10)	Thermalia® comfort, comfort H (13)	Thermalia® comfort, comfort H (17)	Thermalia® comfort, comfort H H (7)	Thermalia® comfort, comfort H H (10)	Thermalia® twin, twin H (20)	Thermalia® twin, twin H (26)	Thermalia® twin, twin H (36)	Thermalia® twin, twin H (42)	Thermalia® twin, twin H H (13)	Thermalia® twin, twin H H (19)	Thermalia® twin, twin H H (22)	Thermalia® dual, dual H, dual R (55)	Thermalia® dual, dual H, dual R (70)	Thermalia® dual, dual H, dual R (85)	Thermalia® dual, dual H, dual R (110)	Thermalia® dual, dual H, dual R (140)	Thermalia® dual, dual H, dual R H (35)	Thermalia® dual, dual H, dual R H (50)	Thermalia® dual, dual H, dual R H (70)	Thermalia® dual, dual H, dual R H (90)
Enamel	CombiVal (= CV)	ER 200	0.95	■	■																								
		ER 300	1.45	■	■	■																							
		ER 400	1.80	■	■	■																							
		ER 500	1.90		■	■																							
		ER 800	3.70		■	■							■				■	■											
		ER 1000	4.50			■							■	■				■	■										
		ESR 200	1.80	■	■	■																							
		ESR 300	2.60	■	■	■					■						■												
		ESR 400	3.80	■	■	■	■	■			■	■	■				■	■	■										
		ESSR 500	5.90		■	■	■	■	■			■	■	■				■	■	■									
		ESSR 800	7.00		■	■			■	■			■	■	■			■	■	■									
		ESSR 1000	9.15			■				■			■	■	■	■			■	■						■			
	MultiVal (= MV)	ERR 300	0.80																										
		ERR 400	1.00	■																									
		ERR 500	1.30	■	■																								
		ESRR 500	4.30	■	■		■	■			■	■	■				■	■	■										
		ESRR 800	5.20	■	■	■		■	■		■	■	■	■			■	■	■										
		ESRR 1000	6.10	■	■	■			■	■		■	■	■	■		■	■	■										
Stainless steel	CombiVal (= CV)	CR 200	1.28		■	■																							
		CR 300	1.28	■	■																								
		CR 500	1.70	■	■																								
		CR 800	2.63		■	■											■												
		CR 1000	2.63		■	■																							
		CSR 300	2.56			■					■						■												
		CSR 400	3.40	■	■	■	■				■						■	■											
		CSR 500	5.26	■	■	■	■	■	■			■		■	■			■	■	■									
		CSR 800	6.30		■	■			■	■				■	■	■		■	■	■									
		CSR 1000	10.00		■	■				■				■	■	■	■		■	■						■			
		CSR 1250	10.00			■								■	■	■	■			■						■			
		CSR 1500	11.30												■	■	■									■			
		CSR 2000	12.70													■	■				■					■	■		
	MultiVal (= MV)	CRR 500	1.28	■	■																								
		CRR 800	1.28	■	■																								
		CRR 1000	1.28	■	■																								
		CSRR 500	5.20	■	■	■	■	■	■		■	■	■	■			■	■	■										
		CSRR 800	7.40		■	■	■	■	■	■		■	■	■	■	■	■	■	■						■				
		CSRR 1000	10.00		■	■		■	■	■		■	■	■	■	■	■	■	■						■				
		CSRR 1500	11.30			■			■	■			■	■	■	■	■	■	■						■				
		CSRR 2000	11.30											■	■	■	■			■					■				

The allocation of the calorifiers to the heat pumps is based on the heating surface of the storage tank coil, heat output of the heat pump for domestic hot water charging, maximum duration of domestic hot water charging and other parameters. For this reason, this allocation table only contains standard values.

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