Page

Air/water heat pumps

Outdoor installation
modulating

Hoval Belaria® eco 3.8 - 10.2 kW
Hoval Belaria® eco compact 3.8 - 10.2 kW

■ Description 329
■ Part No. 331
■ Technical data 335
■ Dimensions 341
Space requirement 343
■ Engineering 347

Available starting May 2020

Hoval Belaria® pro comfort 2.1 - 11.8 kW
Hoval Belaria® pro compact 2.1 - 11.8 kW

■ Description 351
■ Part No. 353
■ Technical data 358
Performance data 363
■ Dimensions 370
■ Engineering 373
■ Examples 374

Available starting July 2020

Split version
modulating

Hoval Belaria® SRM 4.8 - 11.4 kW
Hoval Belaria® compact SRM 4.8 - 11.4 kW

■ Description 377
■ Part No. 378
■ Technical data 385
Performance data 391
■ Dimensions 395
Space requirement 395
■ Engineering 400

Split version
modulating

Hoval UltraSource® B comfort C 2.1 - 17.4 kW
Hoval UltraSource® B compact C 2.1 - 10.2 kW

■ Description 403
■ Part No. 405
■ Technical data 411
Performance data 416
■ Dimensions 423
Space requirement 425
■ Engineering 428
■ Examples 430

Indoor installation
modulating

Hoval Belaria® comfort ICM 2.1 - 12.7 kW

■ Description 433
■ Part No. 434
■ Technical data 447
Performance data 453
■ Dimensions 459
Space requirement “standard” installation 460
Space requirement “flex” installation 462
Space requirement “duct” indoor installation 464
■ Examples 467

Indoor installation
two-stage

Hoval Belaria® twin I 15.9 - 30.4 kW
Hoval Belaria® twin IR 15.9 - 30.4 kW

■ Description 469
■ Part No. 470
■ Technical data 482
Performance data 488
■ Dimensions 492
Space requirement “standard” installation 493
Space requirement “flex” installation 496
Space requirement “vario” installation 497

Page

Outdoor installation
two-stage

Hoval Belaria® twin A 17.2 - 31.6 kW
Hoval Belaria® twin AR 17.2 - 31.6 kW
- Description 499
- Part No. 501
- Technical data 508
  Performance data 512
- Dimensions 516
  Space requirement 516

Outdoor installation
two-stage

Hoval Belaria® dual AR 25.1 - 50.3 kW
- Description 521
- Part No. 522
- Technical data 529
  Performance data 532
- Dimensions 536
  Space requirement 537

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
- Description 541
- Part No. 543
- Technical data 552
  Performance data 555
- Dimensions 561
  Space requirement 562
- Engineering 563
- Examples 564

Indoor installation
single-stage

Hoval Thermalia® comfort 5.8 - 22.3 kW
- Description 567
- Part No. 568
- Technical data 575
  Performance data 579
- Dimensions 583
  Space requirement 583
- Examples 584

Indoor installation
two-stage

Hoval Thermalia® twin 6.7 - 55.4 kW
- Description 587
- Part No. 588
- Technical data 595
  Performance data 598
- Dimensions 602
  Space requirement 602
- Examples 603

Indoor installation
two-stage

Hoval Thermalia® dual 17.5 - 181.1 kW
- Description 605
- Part No. 606
- Technical data 612
  Performance data 617
- Dimensions 623
  Space requirement 625
  Example 626

Page

Engineering heat pumps

- Engineering 627
  General 627
  Room heating and water heating energy efficiency 655
  Calorifier -selection tables 657
  Flat collector - dimension tables 660
  Depth probe - dimension tables 661
  Brine/water - flat collector 663
  Brine/water - depth probe 664
  Water/water - pumping and injection wells 665
  Active/passive cooling 666
  Smart Grid 668

Hoval Belaria® eco (14-18)
Hoval Belaria® eco compact (14/230), (16/230), (18/230)
Air/water heat pump

Hoval Belaria® eco
Hoval Belaria® eco compact

Modulating monoblock heat pump for heating and cooling in the living area. Belaria® eco compact (14/230), (16/230) and (18/230) additionally with integrated calorifier (230 litres) in the indoor unit.

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

Belaria® eco outdoor unit
- Compact floor-mounted air/water heat pump
- Slim and quiet outdoor unit
- Housing made of painted, galvanised sheet steel, colour matt grey, blow-out front colour black
- Belaria® eco (14,16,18) and Belaria® eco compact (14/230), (16/230), (18/230) with speed-controlled scroll compressor
- Refrigerant R32
- L-shaped louvre-type evaporator
- Speed-controlled axial fan
- Outdoor temperature sensor installed
- Condensate drip tray incl. tray heating for channelling all the condensate in the outdoor unit, fixed installation, with 45° drain connection
- Plate-type condenser made of stainless steel/copper
- With cooling function with corresponding hydraulics
- Hydraulic connections at rear (next to evaporator)
    - Heating connections 1″
    - Shut-off filter ball valve in the heat pump return
- Electrical connections at rear (next to evaporator)
    - 400 V main power supply
    - Power supply to indoor unit 230 V, data cable - bus connection to the indoor unit
- Without fitting accessories for fixing the outdoor unit on the ground (4 x M12, on site)
- Integrated carrying straps on the outdoor unit

Belaria® eco indoor unit
- Compact wall-mounted indoor unit
- Casing made from painted, galvanised sheet steel. Colour white.
- Control with heating, cooling and calorifier function (operating unit built in)
- Integrated components:
    - Speed-controlled high-efficiency pump
    - Flow sensor/heat meter
    - E-heating element 3 to 9 kW
    - Diaphragm pressure expansion tank 10 litres
    - Magnetic filter/dirt filter
    - Automatic air vent, safety valve and flow monitor
    - Water pressure sensor
    - Filling and drain valve
- Sensor set consisting of flow sensor and return sensor included in the scope of delivery
- Hydraulic connections at bottom
    - Heating connections 1″
    - Sludge separator in the heating flow and filter ball valve in the heating return
- Domestic hot water set consisting of 3-way switching ball valve, drive and calorifier sensor (see accessories)
- Electrical connections introduced from bottom
- Indoor unit is fed with 230 V from the outdoor unit
- With fitting accessories for fixing the indoor unit to the wall (without screws)

Belaria® eco compact indoor unit
- Compact floor-mounted indoor unit
- Casing made from painted, galvanised sheet steel. Colour white.
- Control with heating, cooling and calorifier function (operating unit built in)
- Integrated calorifier 230 litres
- Stainless steel calorifier (pickled) with PU hard-foam insulation, energy efficiency class B, load profile XL.
- Integrated components:
    - Speed-controlled high-efficiency pump
    - Flow sensor/heat meter
    - E-heating element 3 to 9 kW
    - 3-way switching ball valve for heating/domestic hot water
    - Diaphragm pressure expansion tank 10 litres
    - Magnetic filter/dirt filter
    - Automatic air vent, safety valve and flow monitor
    - Water pressure sensor
- Sensor set consisting of flow sensor (2x, before and after electric heating element), return sensor and calorifier sensor included in the scope of delivery

Model range

Belaria® eco Type	35 °C	55 °C	Heat output A-7W35 kW	 A2W35 kW
(14)	A+++	A++	10.7	8.6
(16)	A+++	A++	11.8	9.2
(18)	A+++	A++	12.7	10.2

Belaria® eco compact Type	35 °C	55 °C	Heat output A-7W35 kW	 A2W35 kW
(14/230)	A+++	A++	10.7	8.6
(16/230)	A+++	A++	11.8	9.2
(18/230)	A+++	A++	12.7	10.2

Energy efficiency class of the compound system with control.

Available starting May 2020

- Hydraulic connections top
  - Heating connections 1″
  - Hot and cold water connections 3/4″
  - Shut-off ball valve heating flow and return (included)
- Indoor unit is fed with 230 V from the outdoor unit
- Electrical connections introduced from top

Delivery
- Outdoor and indoor unit delivered in separate packaging

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

Air/water heat pump

Energy efficiency class
See “Description”

Modulating air/water heat pump for heating and cooling. Consisting of indoor unit and outdoor unit.
Belaria® eco compact (14/230), (16/230) and (18/230) additionally with integrated calorifier (230 litres) in the indoor unit.

Delivery

- Outdoor and indoor unit delivered in separate packaging
- Sensor for calorifier supplied loose in the indoor unit Belaria® eco (14,16,18)

Available starting May 2020

Notice:
Cooling capacities on request

Hoval Belaria® eco

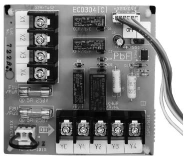
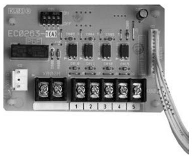
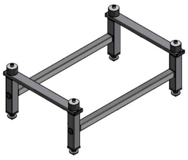
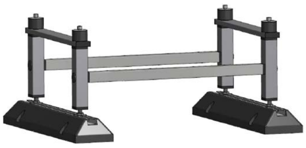
Type	Heat output A-7W35 kW	 A2W35 kW	Part No.
(14)	10.7	8.6	7016 743
(16)	11.8	9.2	7016 744
(18)	12.7	10.2	7016 745

Hoval Belaria® eco compact

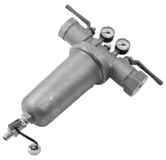
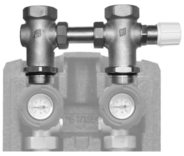
with integrated calorifier (230 litres)

Type	Heat output A-7W35 kW	 A2W35 kW	Part No.
(14/230)	10.7	8.6	7016 746
(16/230)	11.8	9.2	7016 747
(18/230)	12.7	10.2	7016 748

Accessories

		Part No.
	**Room control module** for Belaria® eco for control of room heating/cooling: - Switching room heating/cooling on and off - Displaying and changing room temperature - Changing room operating module for domestic water control: - Switching domestic water mode on and off - Displaying and changing domestic water temperature	6050 263
	**Warm water set DN25-10-ME** for Belaria® eco Consisting of: 3-way switching ball valve for heating/domestic hot water, motor drive and calorifier sensor	6052 212
	**Additional board (A4P/A7P)** Digital input/output board for: - Alarm output - Changeover to external heat source	6019 357
	**Demand board (A8P)** for external power limitation 4 inputs Limitation of current (A) or power (kW) External activation heating/cooling and ON/OFF	2037 415
	**Stand bracket SKS 01** for Belaria® eco for installing the unit on a concrete base slab incl. vibration damper Dimensions: 860 x 565 x 338 (L x W x H) Weight: 15 kg	6051 923
	**Stand bracket SKF 01** for Belaria® eco for installing the unit on the floor with stand feet incl. vibration damper Dimensions: 860 x 565 x 338 (L x W x H) Weight: 20 kg	6051 924
	**Dew point switch FAS** mechanical dew point switch for monitoring the formation of condensation using adjustable switching value	2070 911

Heating/cooling accessories

		Part No.
 **Notice:** Performs the function of sludge separator and strainer.	**System water protection filter** Type: 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 loss. 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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: (∆p<0.1 bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C	2076 374
	**Bypass valve DN 32 (1¼″)** for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m³/h with self-sealing screw connection for mounting between flow and return ball valve **Notice:** The defrosting of the Belaria® eco must be ensured. To prevent the freezing of the plate heat exchanger, a minimum volume flow of 25 litres/minute must be guaranteed. For this reason, an overflow valve must be installed.	6014 849

Heating/cooling accessories

		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 expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**Connection set AS32-2/ HW** for compact mounting of all required fittings of a direct circuit and hot water charging Consisting of: Fully assembled armature group with 2 thermometer ball valves Thermal insulation box made of EPP half-shells 3-way motor valve 2-LR230A included separately Connection T-piece DN 32 in the return flow for connecting the sludge separator CS 32 bottom and the expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 794

Belaria® eco (14-18)
Belaria® eco compact (14/230), (16/230) and (18/230)

Type		**Belaria® eco (14) Belaria® eco compact (14/230)**	**Belaria® eco (16) Belaria® eco compact (16/230)**	**Belaria® eco (18) Belaria® eco compact (18/230)**
• 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 Belaria® eco compact	Domestic hot water	107	107	107
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	4.8/3.6	4.8/3.6	4.8/3.6
Max./min. performance data heating and cooling in acc. with EN 14511				
• Max. heat output A2W35	kW	8.6	9.2	10.2
• Max. heat output A-7W35	kW	10.7	11.8	12.7
• Min. heat output A15W35	kW	5.8	6.2	6.9
• Max. cooling capacity A35W18	kW	Cooling capacities on request		
• Max. cooling capacity A35W7	kW			
• Min. cooling capacity A35W18	kW			
Nominal output data heating in acc. with EN 14511				
• Nominal heat output A2W35	kW	7.5	7.5	7.5
• Power consumption A2W35	kW	1.8	1.8	1.8
• Coefficient of performance A2W35	COP	4.1	4.1	4.1
• Nominal heat output A7W35	kW	5.9	9.0	9.0
• Power consumption A7W35	kW	1.2	1.8	1.8
• Coefficient of performance A7W35	COP	4.8	5.0	5.0
• Nominal heat output A-7W35	kW	10.2	11.4	12.7
• Power consumption A-7W35	kW	3.2	3.6	4.2
• Coefficient of performance A-7W35	COP	3.2	3.1	3.1
Nominal output data cooling in acc. with EN 14511				
• Nominal cooling capacity A35W18	kW	10.6	11.5	12.5
• Power consumption A35W18	kW	2.6	2.8	3.0
• Coefficient of performance A35W18	EER	4.1	4.1	4.1
• Nominal cooling capacity A35W7	kW	6.9	7.9	8.9
• Power consumption A35W7	kW	2.6	2.9	3.3
• Coefficient of performance A35W7	EER	2.7	2.7	2.7
Sound data				
• Sound power level EN 12102 outdoor unit 3) 4)	dB (A)	54	54	54
• Sound pressure level 5 m 2) 3)	dB (A)	35	35	35
• Sound pressure level 10 m 2) 3)	dB (A)	29	29	29
• Max. sound power level outdoor unit	dB(A)	60	60	60
• Min. sound power level outdoor unit (whisper mode)	dB(A)	50	50	50
Hydraulic data				
• Max. flow temperature	°C	70	70	70
• Residual overpressure of circulating pump at max. speed of rotation	kPa	111	97	97
• Max. operating pressure on the heating side	bar	3	3	3
• Max. operating pressure process water side Belaria® eco compact	bar	10	10	10
• Flow/return connection heating	R	1″	1″	1″
• Cold/hot water connection Belaria® eco compact	R	¾″	¾″	¾″
• Maximum air volume outdoor unit heating (maximum speed)	m^3/h	5460	5460	5460
• Nominal air volume outdoor unit heating (nominal rotation speed)	m^3/h	3918	3918	3960
• Maximum air volume outdoor unit cooling (maximum speed)	m^3/h	5880	5880	5880
Cooling technical data				
• Refrigerant		R32	R32	R32
• Compressor		modulating	modulating	modulating
• Refrigerant filling quantity	kg	4.2	4.2	4.2
• Max. length hydraulic connection line total length 50 m. simple length 25 m	m	25	25	25

Type		**Belaria® eco (14) Belaria® eco compact (14/230)**	**Belaria® eco (16) Belaria® eco compact (16/230)**	**Belaria® eco (18) Belaria® eco compact (18/230)**
Electrical data				
• Electrical connection compressor	V / Hz	3~400 / 50	3~400 / 50	3~400 / 50
• Electrical connection electric heating element	V / Hz	3~400 / 50	3~400 / 50	3~400 / 50
• Control electrical connection	V / Hz	1~230 / 50	1~230 / 50	1~230 / 50
• Max. heat pump operating current	A	16	16	16
• Max. electric heating element operating current	A	13	13	13
• Output factor		0.98	0.98	0.98
• External protection main current	A	C 16	C 16	C 16
Dimensions / weight of outdoor unit				
• Dimensions (H x W x D)	mm	1019x1270x532	1019x1270x532	1019x1270x532
• Weight	kg	151	151	151
• Protection class		IPX4	IPX4	IPX4
Dimensions / weight of indoor unit Belaria® eco				
• Dimensions (H x W x D)	mm	840x440x390	840x440x390	840x440x390
• Weight	kg	38	38	38
• Protection class		IP X0B	IP X0B	IP X0B
Dimensions / weight of indoor unit Belaria® eco compact				
• Dimensions (H x W x D)	mm	1850x595x625	1850x595x625	1850x595x625
• Tilting measure	mm	2050	2050	2050
• Weight	kg	118	118	118
• Protection class		IP X0B	IP X0B	IP X0B
Hot water storage tank				
• Storage capacity	l	230	230	230
• Maximum storage tank temperature without electric heating element	°C	63	63	63
• Maximum storage tank temperature with electric heating element Belaria® eco	°C	75	75	75
• Maximum storage tank temperature with electric heating element Belaria® eco compact	°C	65	65	65
• Output capacity at 46 °C draw-off temperature - heat pump [1]	l	300	300	300
• Output capacity at 40 °C draw-off temperature - heat pump [1]	l	350	350	350

[1] 12 °C cold water temperature/58 °C storage tank temperature

[2] 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.

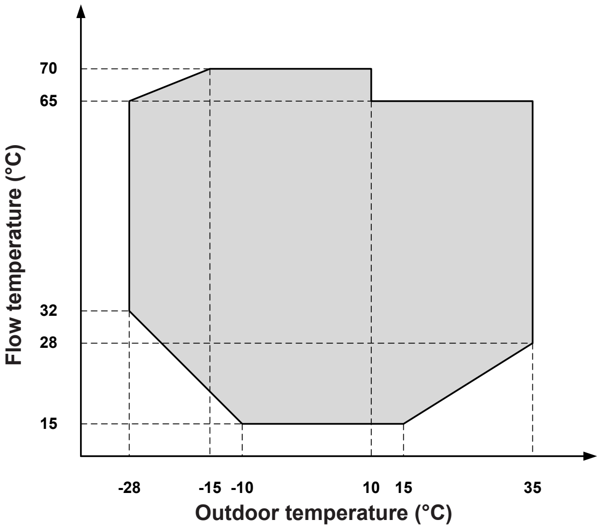
[3] The sound values apply with a clean evaporator. These values are temporarily exceeded before defrosting.

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

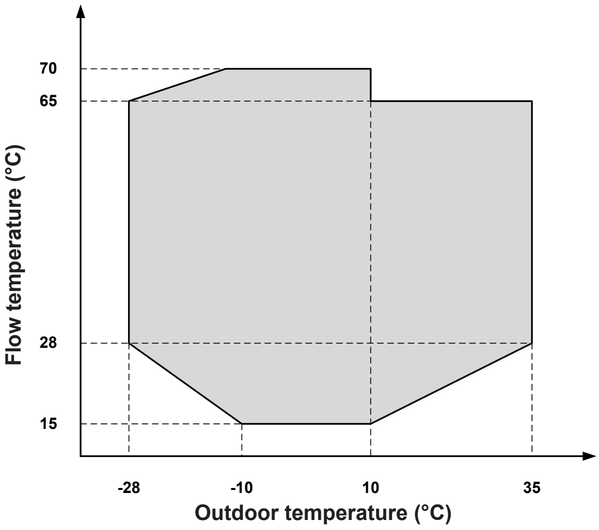
Diagrams of areas of application

Heating

Belaria® eco (14-18)

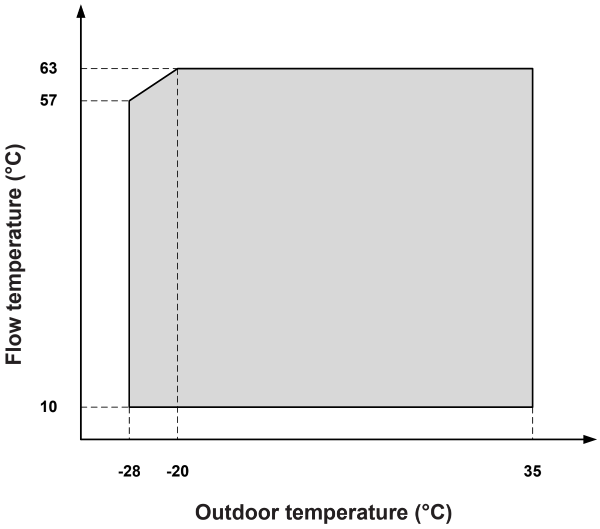


Belaria® eco compact (14/230), (16/230), (18/230)



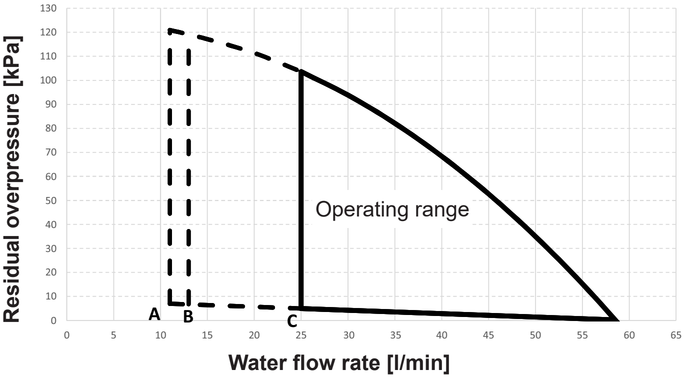
Domestic hot water

Belaria® eco (14-18)
Belaria® eco compact (14/230), (16/230), (18/230)

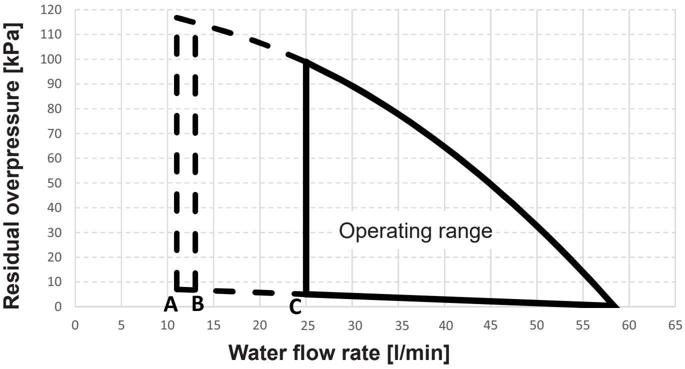


Pump characteristics

Belaria® eco (14-18)



Belaria® eco compact (14/230), (16/230), (18/230)



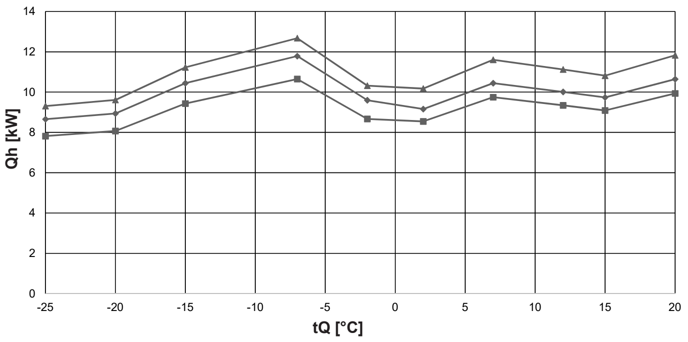
Performance data – heating

Maximum heat output allowing for defrosting losses

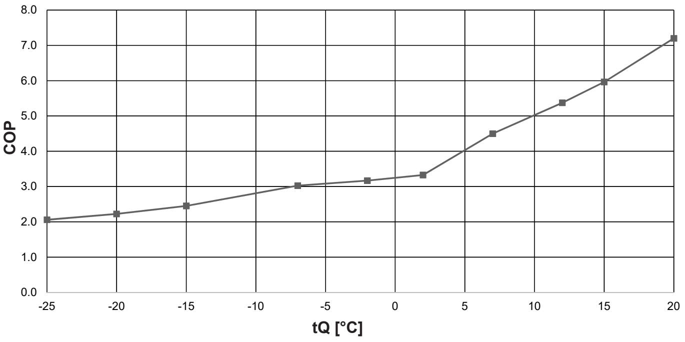
Belaria® eco (14-18), Belaria® eco compact (14/230), (16/230), (18/230)

Data according to EN 14511

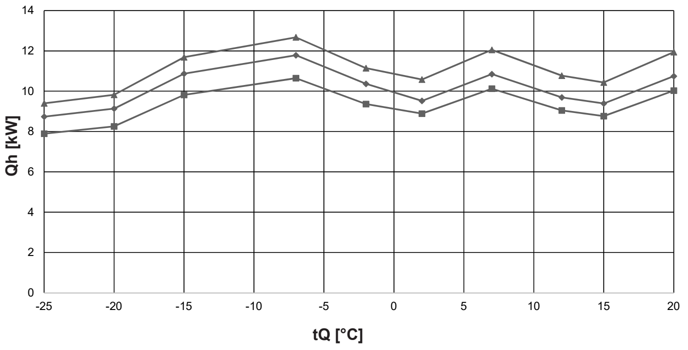
Heat output - t_{FL} 35 °C



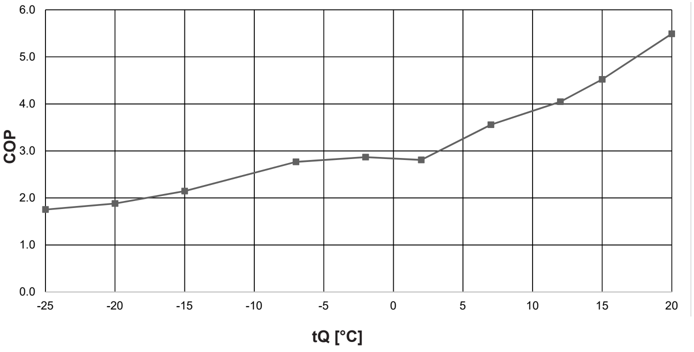
Coefficient of performance - t_{FL} 35 °C



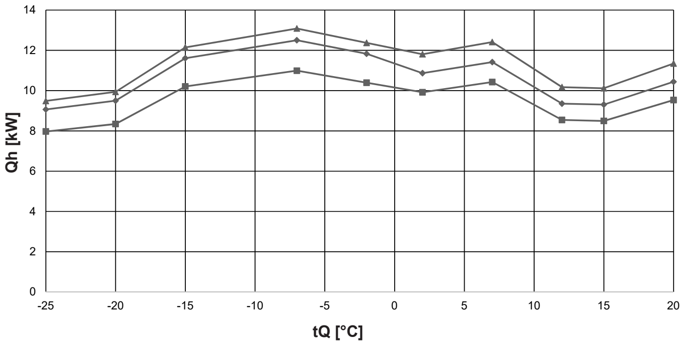
Heat output - t_{FL} 45 °C



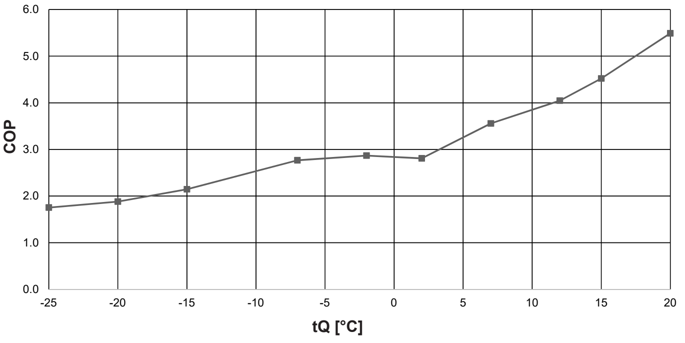
Coefficient of performance - t_{FL} 45 °C



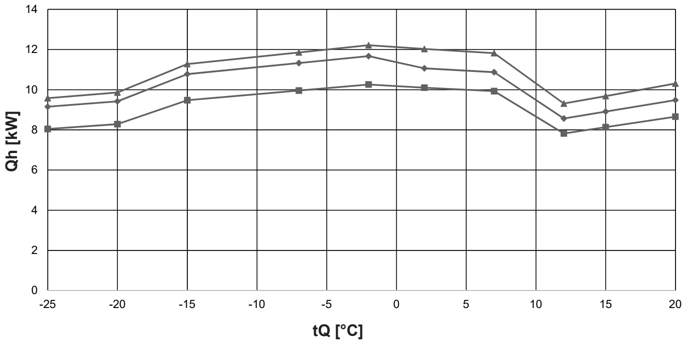
Heat output - t_{FL} 55 °C



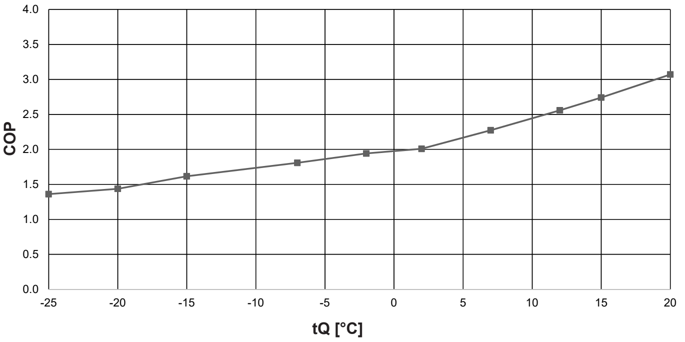
Coefficient of performance - t_{FL} 55 °C



Heat output - t_{FL} 65 °C



Coefficient of performance - t_{FL} 65 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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 eco (14)
—■— Maximum output eco (16)
—▲— Maximum output eco (18)
—■— Coefficient of performance eco (14-18)

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

Performance data – heating

Belaria® eco (14-18), Belaria® eco compact (14/230), (16/230), (18/230)

Data according to EN 14511

			(14)			(16)			(18)	
						Maximum output				
tFL °C	tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-25	7.82	3.80	2.06	8.66	4.21	2.06	9.31	4.52	2.06
	-20	8.07	3.63	2.22	8.94	4.02	2.22	9.61	4.32	2.22
	-15	9.43	3.84	2.45	10.44	4.26	2.45	11.23	4.58	2.45
	-7	10.65	3.52	3.03	11.79	3.89	3.03	12.67	4.19	3.03
	-2	8.67	2.74	3.17	9.60	3.03	3.17	10.32	3.26	3.17
	2	8.55	2.57	3.33	9.16	2.75	3.33	10.17	3.06	3.33
	7	9.75	2.17	4.50	10.44	2.32	4.50	11.60	2.58	4.50
	12	9.34	1.74	5.38	10.01	1.86	5.38	11.12	2.07	5.38
	15	9.09	1.52	5.96	9.74	1.63	5.96	10.82	1.81	5.96
	20	9.93	1.38	7.20	10.64	1.48	7.20	11.83	1.64	7.20
45	-25	7.89	4.50	1.75	8.74	4.99	1.75	9.40	5.36	1.75
	-20	8.26	4.39	1.88	9.14	4.86	1.88	9.83	5.23	1.88
	-15	9.82	4.58	2.14	10.87	5.07	2.14	11.69	5.45	2.14
	-7	10.65	3.85	2.77	11.79	4.26	2.77	12.67	4.58	2.77
	-2	9.36	3.27	2.87	10.37	3.62	2.87	11.15	3.89	2.87
	2	8.89	3.16	2.81	9.52	3.39	2.81	10.58	3.77	2.81
	7	10.13	2.85	3.56	10.85	3.05	3.56	12.05	3.39	3.56
	12	9.05	2.24	4.05	9.69	2.40	4.05	10.77	2.66	4.05
	15	8.77	1.94	4.52	9.39	2.08	4.52	10.44	2.31	4.52
	20	10.03	1.83	5.49	10.75	1.96	5.49	11.94	2.17	5.49
50	-25	7.93	4.97	1.59	8.78	5.51	1.59	9.44	5.92	1.59
	-20	8.38	4.83	1.73	9.27	5.35	1.73	9.97	5.75	1.73
	-15	10.01	4.94	2.02	11.08	5.47	2.02	11.92	5.89	2.02
	-7	10.82	4.32	2.51	11.98	4.78	2.51	12.88	5.14	2.51
	-2	10.03	3.95	2.54	11.11	4.37	2.54	11.94	4.70	2.54
	2	9.40	3.65	2.57	10.08	3.92	2.57	11.19	4.35	2.57
	7	10.28	3.13	3.29	11.01	3.35	3.29	12.23	3.72	3.29
	12	8.90	2.49	3.58	9.54	2.66	3.58	10.60	2.96	3.58
	15	8.67	2.22	3.90	9.29	2.38	3.90	10.33	2.65	3.90
	20	9.78	2.07	4.73	10.48	2.22	4.73	11.65	2.46	4.73
55	-25	7.97	5.50	1.45	9.06	6.25	1.45	9.49	6.54	1.45
	-20	8.35	5.43	1.54	9.49	6.17	1.54	9.93	6.46	1.54
	-15	10.20	5.31	1.92	11.61	6.04	1.92	12.15	6.32	1.92
	-7	10.99	4.79	2.29	12.50	5.45	2.29	13.08	5.70	2.29
	-2	10.39	4.43	2.34	11.82	5.04	2.34	12.37	5.28	2.34
	2	9.92	4.15	2.39	10.86	4.54	2.39	11.81	4.93	2.39
	7	10.42	3.41	3.06	11.42	3.73	3.06	12.41	4.06	3.06
	12	8.54	2.68	3.19	9.35	2.93	3.19	10.17	3.19	3.19
	15	8.49	2.47	3.44	9.30	2.71	3.44	10.11	2.94	3.44
	20	9.53	2.31	4.13	10.44	2.53	4.13	11.35	2.75	4.13
65	-25	8.04	5.91	1.36	9.15	6.73	1.36	9.57	7.04	1.36
	-20	8.28	5.76	1.44	9.42	6.55	1.44	9.86	6.86	1.44
	-15	9.47	5.86	1.62	10.78	6.67	1.62	11.28	6.98	1.62
	-7	9.96	5.51	1.81	11.33	6.26	1.81	11.85	6.55	1.81
	-2	10.26	5.28	1.94	11.67	6.01	1.94	12.21	6.29	1.94
	2	10.10	5.03	2.01	11.07	5.51	2.01	12.03	5.99	2.01
	7	9.93	4.37	2.27	10.87	4.78	2.27	11.82	5.20	2.27
	12	7.82	3.06	2.56	8.57	3.35	2.56	9.31	3.64	2.56
	15	8.13	2.97	2.74	8.91	3.25	2.74	9.68	3.53	2.74
	20	8.66	2.82	3.07	9.48	3.09	3.07	10.31	3.36	3.07
70	-25	-	-	-	-	-	-	-	-	-
	-20	-	-	-	-	-	-	-	-	-
	-15	8.68	5.84	1.48	9.76	6.57	1.48	10.84	7.31	1.48
	-7	9.86	5.58	1.77	11.10	6.28	1.77	12.33	6.98	1.77
	-2	9.67	5.18	1.87	10.87	5.83	1.87	12.08	6.47	1.87
	2	9.51	4.86	1.96	10.69	5.46	1.96	11.88	6.07	1.96
	7	8.80	4.21	2.09	9.90	4.74	2.09	11.00	5.26	2.09
	12	-	-	-	-	-	-	-	-	-
	15	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-

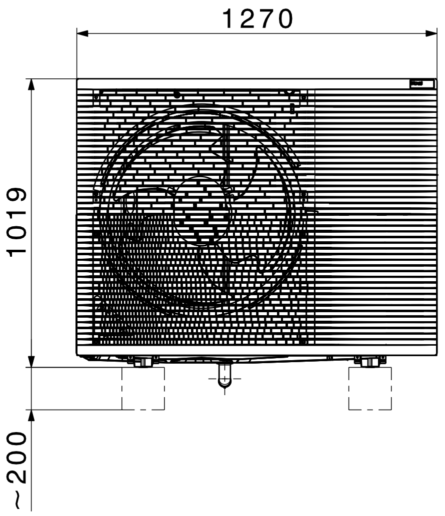
tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = Heat output (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

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

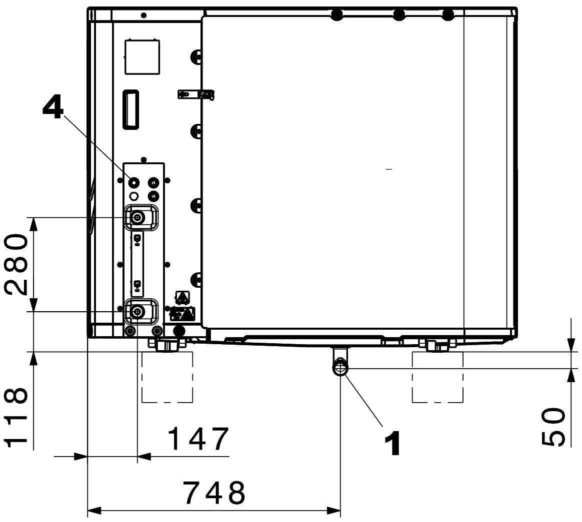
Belaria® eco
Outdoor unit

(Dimensions in mm)

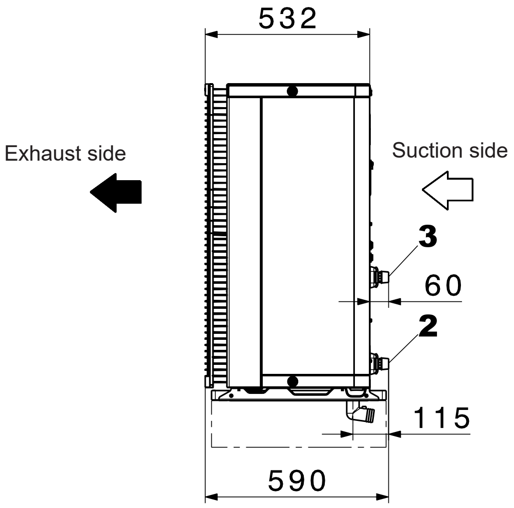
Front view



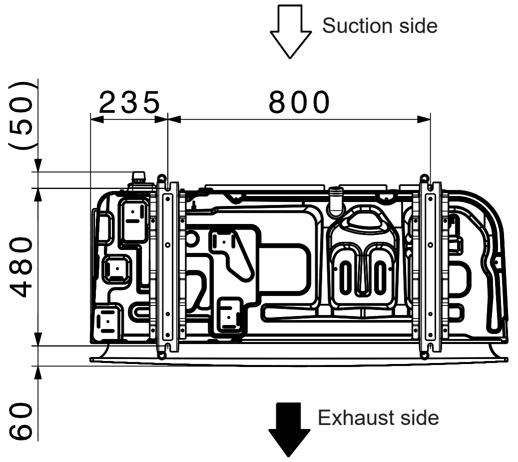
Rear view



View from right



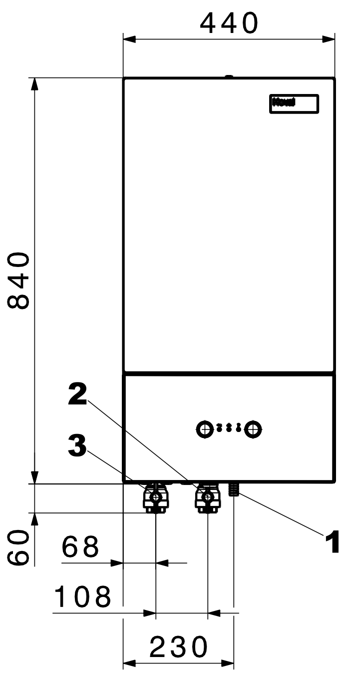
View from below

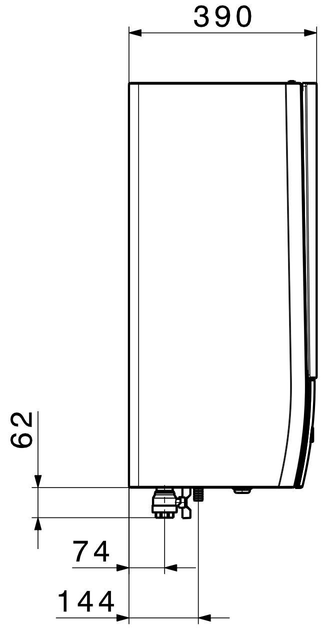


1 Condensate drain Ø 42 mm
2 Connection hydraulic connection lines return 1″ ext. thread
3 Connection hydraulic connection lines flow 1″ ext. thread
4 Electrical connection

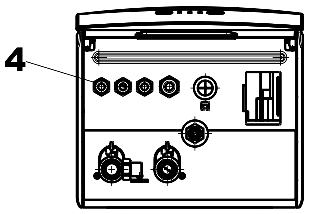
Belaria® eco
Indoor unit

(Dimensions in mm)





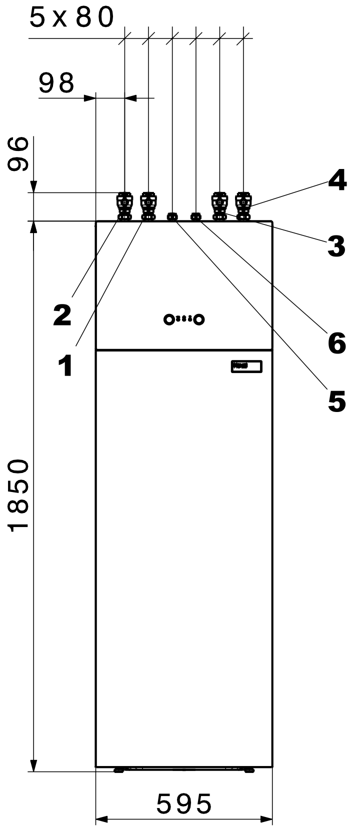
View from below

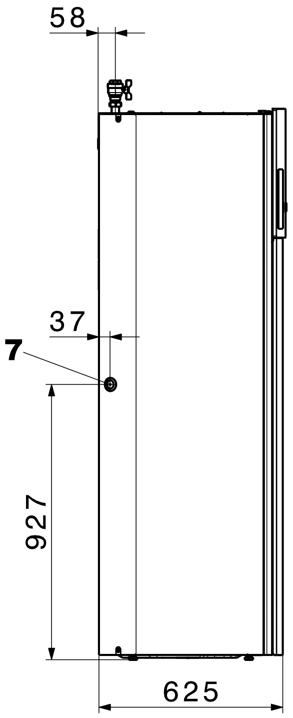


1 Condensate drain ∅ 18 mm
2 Flow outdoor unit 1″ int. thread (return not guided through indoor unit)
3 Flow heating 1″ int. thread
4 Electrical connection

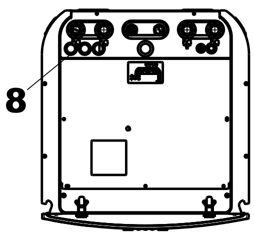
Belaria® eco compact
Indoor unit

(Dimensions in mm)





View from above

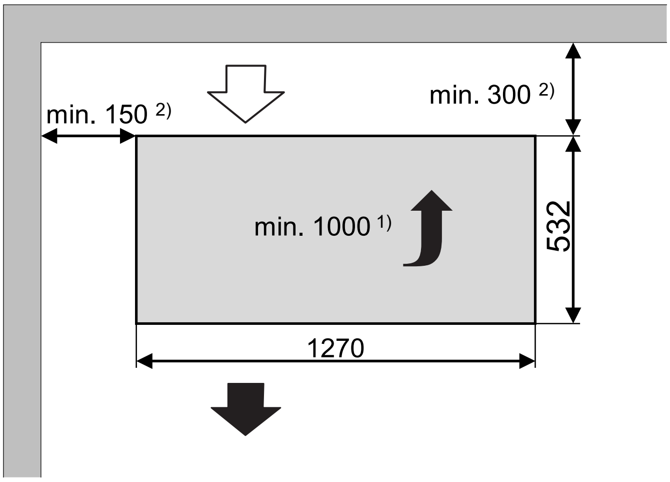


1 Outdoor unit flow 1″ int. thread
2 Outdoor unit return 1″ int. thread
3 Flow heating circuit 1″ int. thread
4 Return heating circuit 1″ int. thread
5 Hot water connection ¾″ int. thread
6 Cold water connection ¾″ int. thread
7 Condensate drain ∅ 20 mm
8 Electrical connection

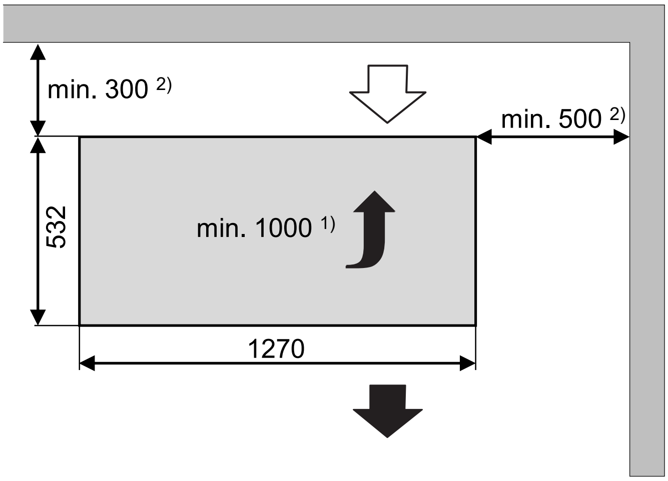
Space requirement

(Dimensions in mm)

**Belaria® eco
wall corner left
Outdoor unit**



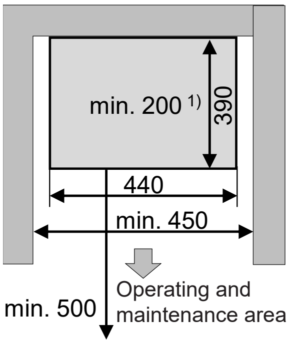
**Belaria® eco
Wall corner right
Outdoor unit**



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

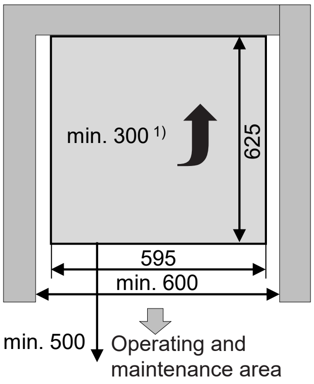
[1] In order to ensure accessibility during maintenance, a clearance of at least 1000 mm upwards must be maintained.
[2] For any service work, the minimum clearances at the rear and sides of the heat pump must be observed.

**Belaria® eco
Indoor unit wall-mounted**



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

**Belaria® eco compact
Indoor unit floor-mounted**

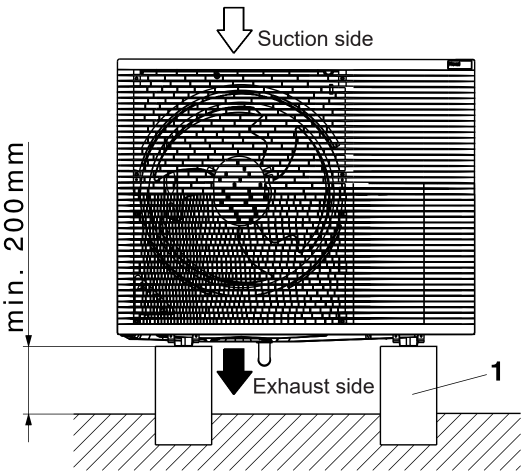


[1] To ensure accessibility to the electrical/hydraulic connections, a clearance of at least 300 mm must be provided above the indoor unit! If the indoor unit of the Belaria® compact is placed in a niche, the condensation hose must first be led out at the back.

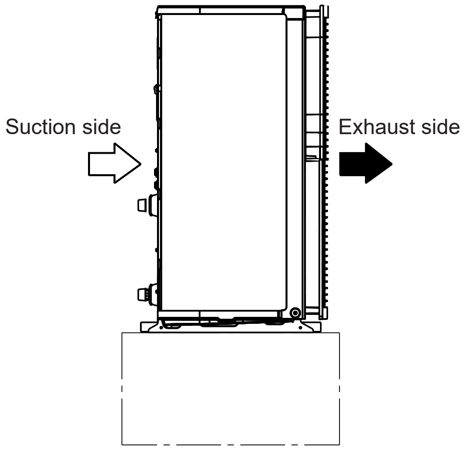
Installation variants for Belaria® eco outdoor unit

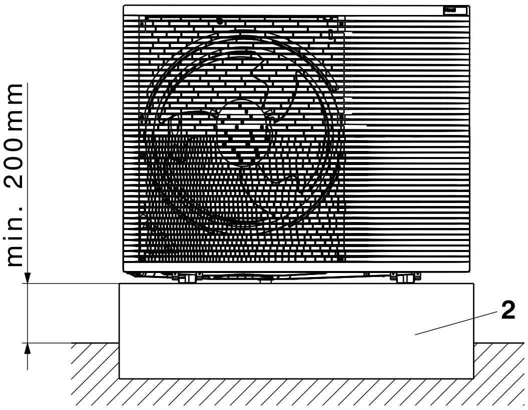
(Dimensions in mm)

Firm base on site



View from right



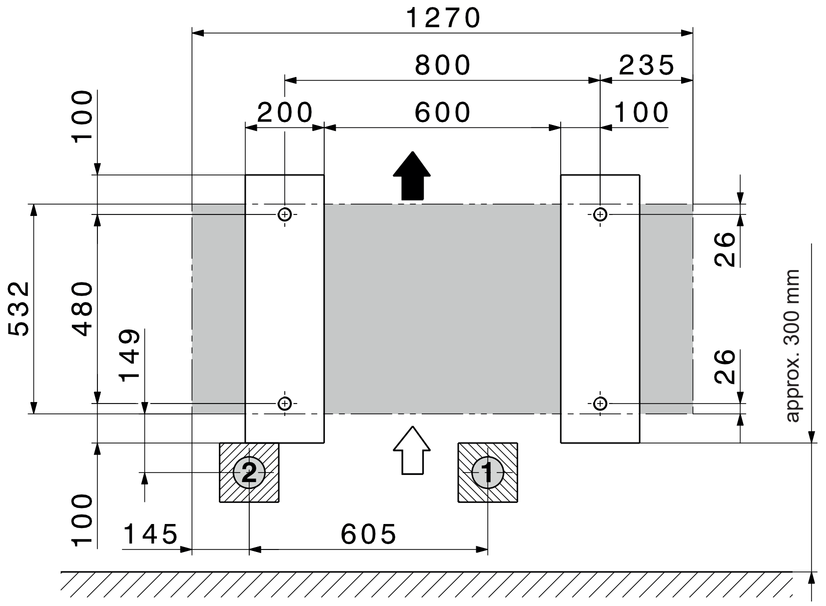


1 Concrete base on site
2 Floor plate on site

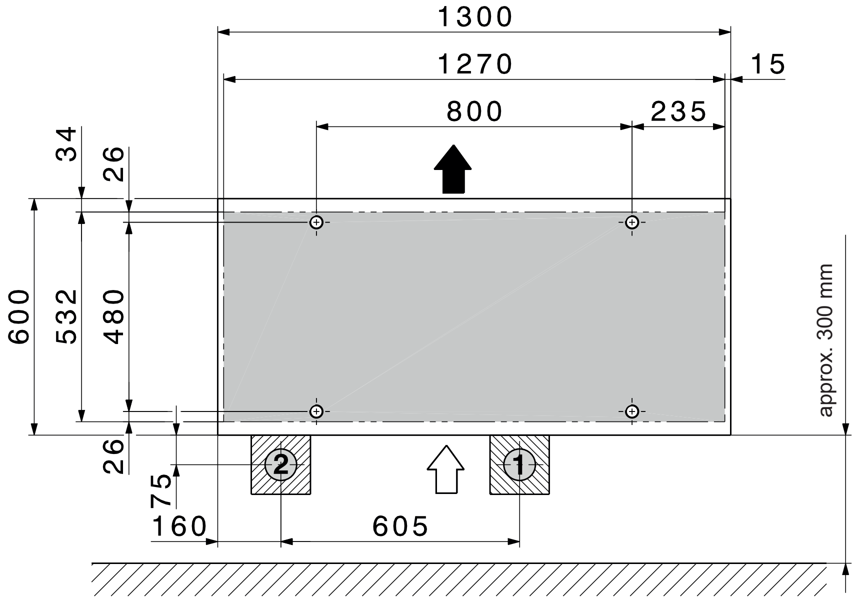
Installation variants for Belaria® eco outdoor unit

(Dimensions in mm)

Strip foundation
Plan concrete base set
(view from above)

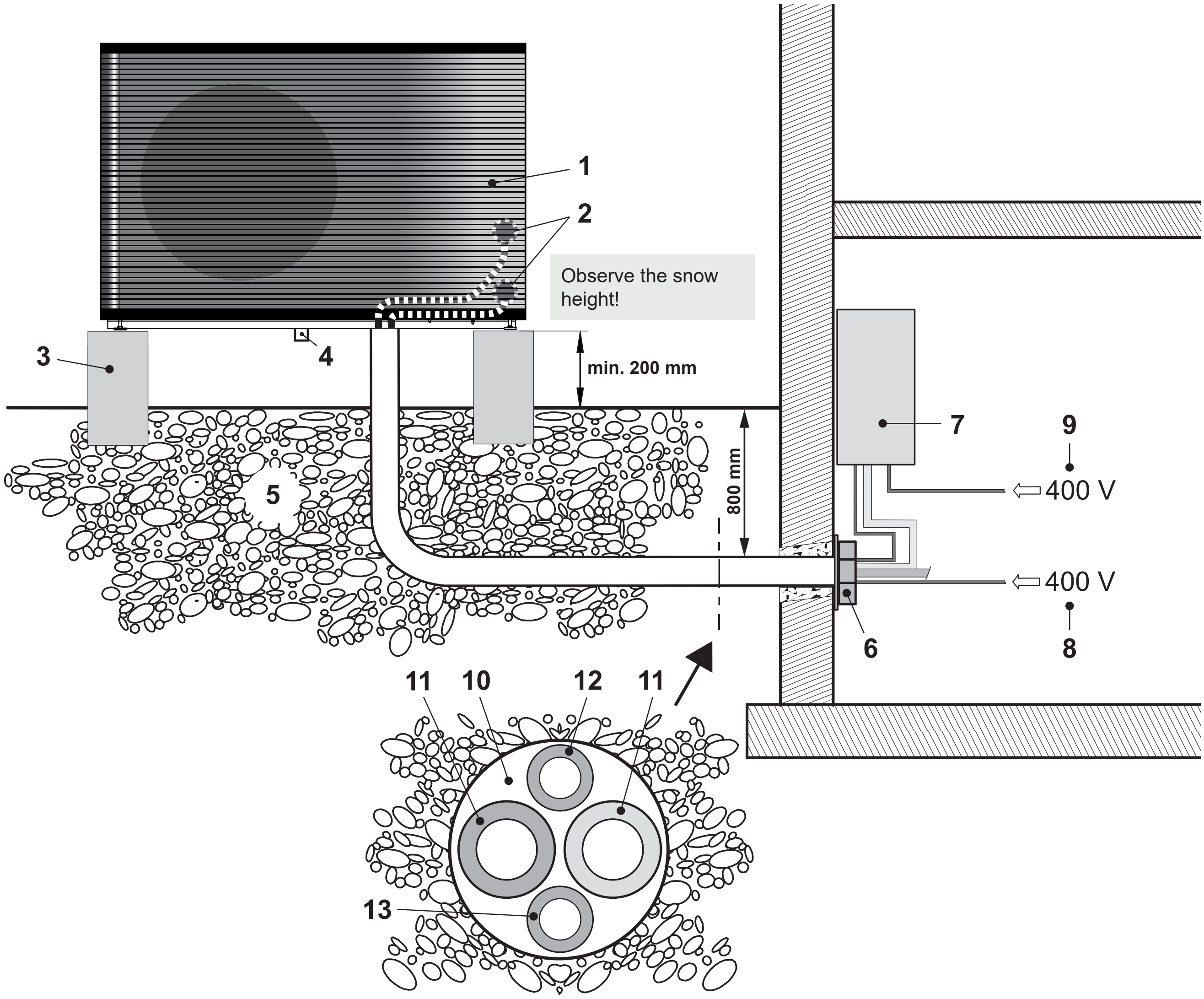


Floor plate
Plan
(view from above)



1 Condensate drain Ø 42 mm
2 Connection hydraulic connection lines return 1″ ext. thread
2 Connection hydraulic connection lines flow 1″ ext. thread
2 Electrical connection

Configuration and connection diagram Belaria® eco



1 Outdoor unit
2 Connection from hydraulics (FL+RT), electrics
3 Concrete base
4 Condensate drain Ø 42 mm
5 Seepage (gravel layer)
6 Wall bushing
(hydraulic and electrical connections)
7 Indoor unit Belaria® eco (14,16,18)
  - On the Belaria® eco compact (14,16,18/230), the hydraulic and electrical connections are located on the top of the unit!
8 Main current
3 x 400 V / 50 Hz (5-wire)
9 Electric heating element main current
3 x 400 V / 50 Hz (5-wire)
Network cables (optional)
10 Empty tube for hydraulics and electrics
11 Connection line FL + RT
12 Empty tube for electrical connections for outdoor unit
Main current outdoor unit
3 x 400 V / 50 Hz
13 Empty tube for control current for indoor unit
4 x 1.5 mm² (4-wire)

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

Set-up
- The distance between the indoor and outdoor unit must be as short as possible. Only short and simple routing of lines guarantees cost effectiveness and low heat losses.
- The maximum line length according to the installation must not be exceeded.
- There must be no building openings (doors, shafts, ventilation openings, etc.) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Make sure that the installation location is well ventilated. Fan openings must not be blocked.
- DO NOT install the unit in the following places or locations:
  - In a potentially explosive atmosphere.
  - In places where there is a risk of fire due to escaping flammable gases (e.g. thinner or petrol) or airborne carbon fibres or flammable dust particles.
  - In places where corrosive gases (example: sulphuric acid gas) are produced. Corrosion of copper pipes and solder joints can lead to leaks in the refrigerant circuit.
- Wall ducts into the building must be airtight.
- The outdoor unit must not be placed in or near floor recesses.
- No installation on roofs or on the wall (wall mounting)
- The outdoor unit must not be placed closer than one metre to the boundary of the property.
- 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 (> 1 m).
- Due to efficient water heating, the line length with the Belaria® eco between the calorifier and the indoor unit is not allowed to be more than 10 m.

Outdoor unit
The outdoor unit is installed outdoors. The installation location must be selected carefully. It is essential that the following ancillary conditions are met:
- The maximum line length must be observed according to the installation.
- The connection lines must be laid insulated and frost-proof.
- The installation location must be chosen in such a way that no noise pollution can occur (do not install near bedrooms, keep a distance from neighbours), hedges and bushes can have a sound-absorbing effect.
- Unobstructed air inflow and outflow must be possible.
- It is imperative that the minimum distances are observed (see Dimensions/Space requirement)
- The intake air must be free of impurities such as sand and aggressive substances such as ammonia, sulphur, chlorine etc.
- The outdoor unit must be installed on a load-bearing fixed structure.
- If the unit is installed at wind-prone locations, the alignment of the heat pump must be selected in such a way that the expected wind direction is crossways to the suction direction of the outdoor unit.
- If it is not possible to install in areas subject to strong winds, 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/stand brackets.
- The load-bearing capability must be adequate. The unit must be fixed there four times with M12 screws.
- Air heat pumps generate condensation during operation. This can amount to 15 litres per defrost cycle within 2 minutes for the outdoor unit of the Belaria® eco.
- The condensate drain must be protected against frost.
- If the discharge is into the sewage system, a siphon must be provided or the duct lead-through into the ground must be sealed so that no refrigerant can enter the sewage system uncontrolled.
- The condensate trough included in the outdoor unit is already equipped with a tank heater at the factory and thus prevents freezing.
- The condensate drain must be secured on site with a 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.

Indoor unit
- The installation location must be selected in accordance with the valid requirements and directives.
- The indoor unit must be installed in a room protected against frost, by an approved specialist company. Room temperature must be between 5 °C and 35 °C.
- Installation in wet rooms, dusty rooms or rooms with a potentially explosive atmosphere is not permitted.
- To minimise vibration and noise inside the building, the inside of the heat pump should be isolated as well as possible from the building structure. For example, indoor units should never be installed on lightweight ceilings/floors.
- The connections for the heating flow and return in the Belaria® eco are on the bottom and in the Belaria® eco compact 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 Belaria® eco compact.
- Due to the accessibility to the hydraulic system, the distances must be maintained on all sides (see Dimensions/Space requirements).
- False flow rates as a result of incorrect dimensions of the pipework, incorrect fittings or improper pump operation can cause damage to the heat pump.

The installation of a magnetic sludge separator or a system water protection filter is mandatory.

Electrical connections
- The electrical connection must be carried out by a qualified technician and registered with the responsible energy supply company. The relevant electrical installation company is responsible for ensuring that electrical connection is carried out in accordance with standards and that safeguard measures are put in place.
- The mains voltage at the connection terminals of the heat pump must be 400 V or 230 V +/-10%. The dimensions of the connection line must be checked by the electrical company carrying out the work.
- A fault-current circuit breaker with 30 mA is recommended. Country-specific requirements must be complied with. If the “fault-current circuit breaker” safeguard measure is implemented nevertheless by the electrical company, a separate fault-current circuit breaker is recommended for the heat pumps.
- Owing to the starting currents that occur, circuit breakers with a type “C” tripping characteristic with 16 A or 20 A are to be used for the main circuit.
- The electrical connection and feeder lines must be copper cables.
- Please refer to the wiring diagram for electrical details.
- The wall feedthrough should slope down from the inside to the outside.
- To avoid damage, the opening should be padded on the inside or, for example, lined with a PVC pipe.
- After installation, the wall opening must be sealed with a suitable sealing compound on site, observing the fire protection regulations.
- The distance between the high and low voltage cables should be at least 50 mm.

Routing of the hydraulic connection lines

- If the hydraulic connection lines are laid in the ground, this must be done in a protective tube. For example, this can be a PVC pipe with a diameter of 150 mm.
- Wall ducts must be sealed to the outside on site.
- After the hydraulic connection lines have been laid, they must be checked for damage and reinsulated. In case of cooling, condensate can form on the pipes.
- The hydraulic connection lines must be laid decoupled from the building and must never be laid flush-mounted.
- Care must be taken to ensure that water pipes do not pass through the sleeping or living areas.
- Shut-off valves must be installed in accordance with the corresponding hydraulic diagram. The shut-off valves are not allowed to be opened until immediately before commissioning.

Room cooling

- Room cooling by fan convectors 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.

Further guidelines
see “Engineering”

Connection on drinking water side

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

Installation on heating side

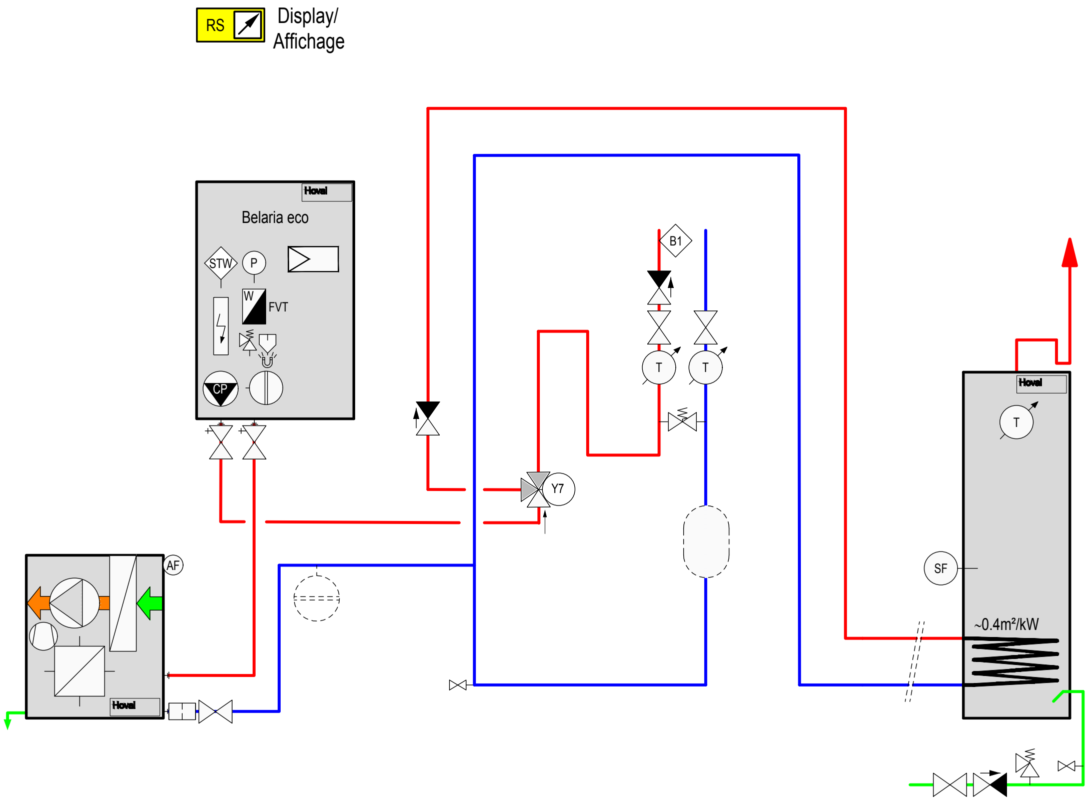
- All pertinent laws, regulations and standards for heating house pipework and for heat pump systems must be complied with.
- A sludge separator is installed in the heating flow and a filter ball valve in the heating return.
- The safety and expansion devices for closed heating systems must be provided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

Transport and storage

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

Belaria® eco
Air/water heat pump with
- calorifier
- 1 direct circuit

Hydraulic schematic BBANE010



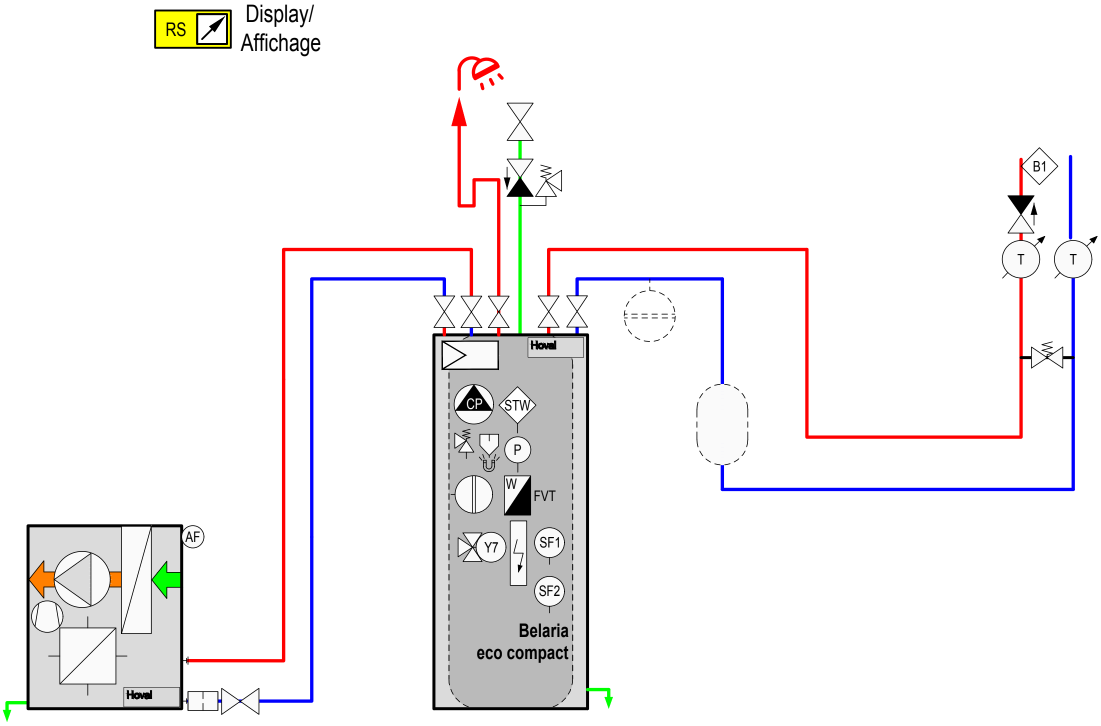
Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

AF	Outdoor sensor
B1	Flow temperature monitor (if required)
CP	Condenser pump
RS	Heat generator data bus
SF	Calorifier sensor
STW	Flow monitor
W	Flow sensor (FVT)
Y7	Switching valve

Belaria® eco compact

Air/water heat pump with
- calorifier
- 1 direct circuit

Hydraulic schematic BBAOE010



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

AF	Outdoor sensor
B1	Flow temperature monitor (if required)
CP	Condenser pump
RS	Heat generator data bus
SF1	Calorifier sensor 1
SF2	Calorifier sensor 2
STW	Flow monitor
W	Flow sensor (FVT)
Y7	Switching valve

Hoval Belaria® pro comfort
Hoval Belaria® pro compact

Modulating monoblock heat pump for heating and cooling in the living area. Belaria® pro compact (8/100/270) and (13/100/270) additionally with integrated buffer storage tank (100 litres) and calorifier (270 litres) in the indoor unit.

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

Belaria® pro outdoor unit
- Compact floor-mounted air/water heat pump
- Elegant and extremely quiet outdoor unit
- Housing with sheet metal enclosure, powder-coated, anthracite colour (DB703)
- Belaria® pro (8,13) with speed-controlled scroll compressor
- Refrigerant R290
- L-shaped louvre-type evaporator
- Speed-controlled axial fan with FlowGrid (inlet grille)
- Condensate drip tray incl. tray heating and condensate trace heater for channelling all the condensate in the outdoor unit, fixed installation, 1″ connection
- Plate-type condenser made of stainless steel/copper
- With cooling function with corresponding hydraulics
- Hydraulic connections behind louvre grille
  - Heating connections 1″
  - Filter ball valve in heat pump return
- Electrical connections behind louvre grille
  - 230 V control current, supplied from the indoor unit
  - 400 V main power supply
  - Data cable - bus connection to the indoor unit
- With fitting accessories for fixing the outdoor unit on the ground

Belaria® pro comfort indoor unit
- Compact wall-mounted indoor unit
- Casing made of structured EPP, colour black
- TopTronic® E controller installed
- With WFA-200S automatic heat pump device
- Integrated components:
  - Speed-regulated high-efficiency pump
  - Flow sensor/heat meter
  - Electric heating element 6 kW
  - 3-way switching ball valve for heating/domestic hot water
- Sensor set consisting of outdoor sensor, flow sensor and domestic hot water sensor included in the scope of delivery
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- Hydraulic connections at bottom
  - Heating connections 1″
- Electrical connections introduced from bottom
- With fitting accessories for fixing the indoor unit to the wall

Model range

Belaria® pro comfort Type	35 °C	55 °C	Heat output 1) A-7W35 kW	 A2W35 kW	Cooling capacity 1) A35W18 kW
(8)	A+++	A+++	2.0-8.3	2.1-8.3	3.1-10.2
(13)	A+++	A+++	4.0-10.3	4.1-11.8	5.1-14.0

Belaria® pro compact Type	35 °C	55 °C	Heat output 1) A-7W35 kW	 A2W35 kW	Cooling capacity 1) A35W18 kW
(8/100/270)	A+++	A+++	2.0-8.3	2.1-8.3	3.1-10.2
(13/100/270)	A+++	A+++	4.0-10.3	4.1-11.8	5.1-14.0

Energy efficiency class of the compound system with control.

1) Modulation range

Available starting July 2020

Belaria® pro compact indoor unit
- Compact floor-mounted indoor unit
- Casing made from painted, galvanised sheet steel. Colour flame red/brown red (RAL 3000/RAL 3011)
- TopTronic® E controller installed
- With WFA-200S automatic heat pump device
- Integrated buffer storage tank 100 litres
- Integrated calorifier 270 litres
- Enamel painted calorifier with PU hard-foam insulation, energy efficiency class B, load profile XL. Maintenance flange and magnesium protection anode built in
- Integrated components:
  - Speed-regulated high-efficiency pump
  - Flow sensor/heat meter
  - Electric heating element 6 kW
  - 3-way switching ball valve for heating/domestic hot water
  - Heating/cooling circuit pump and mixer
  - Shut-off ball valves
- Sensor set consisting of outdoor sensor, flow sensor and calorifier sensor included in the scope of delivery
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “Various system components”
- Hydraulic connections top
  - Heating connections 1″
  - Hot water connection ¾″
  - Cold water connection 1″
- Electrical connections introduced from top

TopTronic® E controller

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

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 DHW charging circuit
  - Bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast5 basic plug set

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

Number of additional modules that can be installed in the heat generator:
- 1 module expansion and 1 controller module
  or
- 2 controller modules

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

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

Delivery
- Indoor and outdoor unit delivered packaged separately
- Sensor set in the indoor unit supplied loose

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

Part No.

Air/water heat pump

Energy efficiency class
See “Product description”

Modulating air/water heat pump for heating and cooling. Comprising indoor unit and outdoor unit.
Belaria® pro compact (8/100/270) and (13/100/270) additionally with integrated buffer storage tank (100 litres) and calorifier (270 litres) in the indoor unit.

With built-in Hoval TopTronic® E control
Control functions integrated for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer (optional)
- 1 hot water loading circuit
- bivalent and cascade management

Can be optionally expanded by max. 2 module expansions:
- module expansion heating circuit and
- module expansion heat accounting or
- module expansion universal

Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Delivery
- Indoor and outdoor unit delivered packaged separately
- Sensor set in the indoor unit supplied loose

Available starting July 2020

Hoval Belaria® pro comfort

Type	Heat output [1] A-7W35 kW	A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8)	2.0-8.3	2.1-8.3	3.1-10.2	7018 083
(13)	4.0-10.3	4.1-11.8	5.1-14.0	7018 084

[1] Modulation range

Hoval Belaria® pro compact

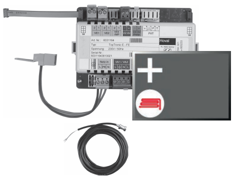
with integrated buffer storage tank (100 litres) and calorifier (230 litres)

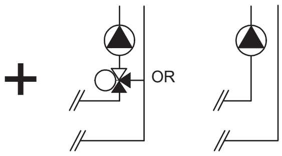
Type	Heat output [1] A-7W35 kW	A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8)	2.0-8.3	2.1-8.3	3.1-10.2	7018 085
(13)	4.0-10.3	4.1-11.8	5.1-14.0	7018 086

[1] Modulation range

Part No.

TopTronic® E module expansions
for TopTronic® E basic module heat generator





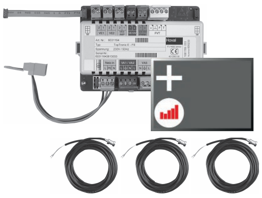
TopTronic® E module expansion heating circuit TTE-FE HK
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

incl. assembly material
1x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

6034 576



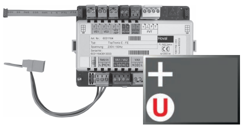
TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

each incl. energy balancing

incl. assembly material
3x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

incl. assembly material

Can be installed in:
Boiler control, wall housing, control panel

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.

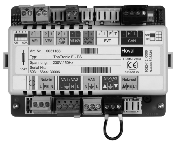
6034 575

Part No.

Accessories for TopTronic® E

Supplementary plug set

for basic module heat generator (TTE-WEZ)	6034 499
for controller modules and module expansion TTE-FE HK	6034 503



TopTronic® E controller modules

TTE-HK/WW	TopTronic® E heating circuit/ hot water module	6034 571
TTE-SOL	TopTronic® E solar module	6037 058
TTE-PS	TopTronic® E buffer module	6037 057
TTE-MWA	TopTronic® E measuring module	6034 574

TopTronic® E room control module

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

HovalConnect

HovalConnect LAN	6049 496
HovalConnect WLAN	6049 498

TopTronic® E interface modules

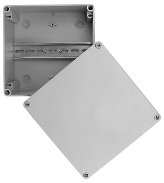
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensor

AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776

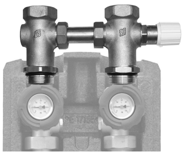


System housing

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

Bivalent switch	2061 826

Heating/cooling accessories

		Part No.
	**Bypass valve DN 32 (1¼″)** for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m³/h with self-sealing screw connection for mounting between flow and return ball valve	6014 849
	**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 expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**System water protection filter** Type: 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 loss. 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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: ($\Delta p<0.1$ bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C	2076 374

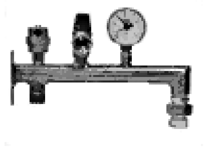
Notice:
Performs the function of sludge separator and strainer.

Part No.

Domestic hot water accessories

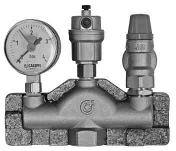
Dew point switch FAS
mechanical dew point switch
for monitoring the
formation of condensation using
adjustable switching value

2070 911



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

2015 354



Safety set SG15-1″
Suitable up to max. 50 kW
complete with safety valve (3 bar)
Pressure gauge and automatic air vent
with cut off valve
Connection: 1″ internal thread

641 184

Screw-in electric heating element
for plants with buffer storage tank as
emergency heating.

Type	Heat output [kW]	Installation length [mm]	Part No.
EP2.5	2.35	390	6049 557
EP3.5	3.6	500	6049 558
EP5	4.9	620	6049 559
EP7.5	7.5	850	6049 560

Belaria® pro comfort (8,13)
Belaria® pro compact (8/100/270,13/100/270)

Type		**Belaria® pro comfort (8)** **Belaria® pro compact (8/100/270)**	**Belaria® pro comfort (13)** **Belaria® pro compact (13/100/270)**
• Energy efficiency class of the compound system with control	35 °C/55 °C	A+++/A+++	A+++/A+++
• Energy efficiency class load profile XL	Domestic hot water	-/A	-/A
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.26 / 3.92	5.15 / 3.94
Max./min. performance data heating and cooling in acc. with EN 14511			
• Max. heat output A2W35	kW	8.3	11.8
• Max. heat output A-7W35	kW	8.3	10.3
• Min. heat output A15W35	kW	2.6	4.0
• Max. cooling capacity A35W18	kW	10.2	14
• Max. cooling capacity A35W7	kW	7.9	10.8
• Min. cooling capacity A35W18	kW	3.1	5.1
Nominal output data heating in acc. with EN 14511			
• Nominal heat output A2W35	kW	3.5	5.3
• Power consumption A2W35	kW	0.8	1.2
• Coefficient of performance A2W35	COP	4.6	4.6
• Nominal heat output A7W35	kW	4.1	5.9
• Power consumption A7W35	kW	0.7	1.1
• Coefficient of performance A7W35	COP	5.4	5.5
• Nominal heat output A-7W35	kW	4.0	5.3
• Power consumption A-7W35	kW	1.2	1.5
• Coefficient of performance A-7W35	COP	3.4	3.5
Nominal output data cooling in acc. with EN 14511			
• Nominal cooling capacity A35W18	kW	6.3	9.7
• Power consumption A35W18	kW	1.3	2.1
• Coefficient of performance A35W18	EER	4.9	4.6
• Nominal cooling capacity A35W7	kW	4.4	6.5
• Power consumption A35W7	kW	1.3	2.0
• Coefficient of performance A35W7	EER	3.5	3.2
Sound data			
• Sound power level EN 12102 outdoor unit 3) 4)	dB (A)	46	51
• Sound pressure level 5 m 2) 3)	dB (A)	27	32
• Sound pressure level 10 m 2) 3)	dB (A)	21	26
• Max. sound power level outdoor unit	dB(A)	55	57
• Min. sound power level outdoor unit (whisper mode)	dB(A)	44	49
Hydraulic data			
• Max. flow temperature	°C	70	70
• Max. flow rate heating side with A7/W35, ΔT 6 K	m^3/h	1.2	1.8
• Nominal flow rate heating side with A7/W35, ΔT 5 K	m^3/h	0.7	1.0
• Pressure drop heating side at nominal flow	kPa	4.5	11
• Residual overpressure of circulating pump at max. speed of rotation	kPa	69	81
• Max. operating pressure on the heating side	bar	3	3
• Max. operating pressure process water side	bar	10	10
• Flow/return connection heating	R	1″	1″
• Cold water connection Belaria® pro comfort	R	1″	1″
• Cold/hot water connection Belaria® pro compact	R	1″ / ¾″	1″ / ¾″
• Nominal air volume outdoor unit (A7W35 and nominal rotation speed)	m^3/h	2000	3000
Cooling technical data			
• Refrigerant		R290	R290
• Compressor		modulating	modulating
• Refrigerant filling quantity	kg	1.2	1.8
• Compressor oil filling quantity	l	0.9 / PZ46M	0.9 / PZ46M
• Max. length hydraulic connection line total length 60 m, simple length 30 m	m	30	30

Type		**Belaria® pro comfort (8)** **Belaria® pro compact (8/100/270)**	**Belaria® pro comfort (13)** **Belaria® pro compact (13/100/270)**
Electrical data			
• Electrical connection compressor	V / Hz	3~400/50	3~400/50
• Electrical connection electric heating element	V / Hz	3~400/50	3~400/50
• Control electrical connection	V / Hz	1~230/50	1~230/50
• Max. heat pump operating current	A	8.5	9.5
• Max. compressor operating current	A	8.5	9.5
• Max. electric heating element operating current	A	13	13
• Max. fan operating current	A	0.3	0.6
• Max. fan power consumption	W	70	140
• Max. starting current heat pump	A	8.5	9.5
• Output factor		0.88	0.88
• External protection main current	A	C/K 13	C/K 13
• External protection control current	A	B/Z 13	B/Z 13
• External protection electric heating element	A	B/Z 13	B/Z 13
Dimensions / weight of outdoor unit			
• Dimensions (H x W x D)	mm	954x1573x791	954x1573x791
• Weight	kg	245	255
• Protection class		IP44	IP44
Dimensions / weight of indoor unit Belaria® pro comfort			
• Dimensions (H x W x D)	mm	1005x550x280	1005x550x280
• Weight	kg	30	30
• Protection class		IP 20	IP 20
Dimensions / weight of indoor unit Belaria® pro compact			
• Dimensions (H x W x D)	mm	1808x790x790	1808x790x790
• Tilting measure	mm	1933	1933
• Weight	kg	220	220
Hot water storage tank			
• Storage capacity	l	270	270
• Maximum storage tank temperature with electric heating element	°C	75	75
• Output capacity at 46 °C draw-off temperature - heat pump [1]	l	330	330
• Output capacity at 40 °C draw-off temperature - heat pump [1]	l	390	390

[1] 12 °C cold water temperature/58 °C storage tank temperature

[2] 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.

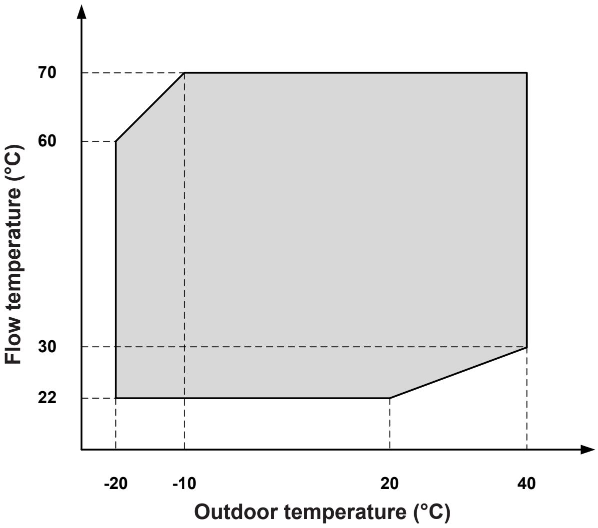
[3] The sound values apply with a clean evaporator. These values are temporarily exceeded before defrosting.

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

Diagrams of areas of application

Heating and domestic hot water

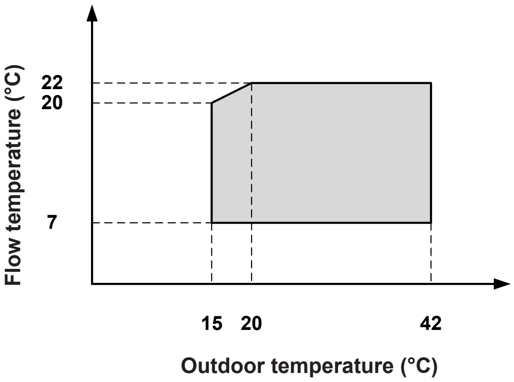
Belaria® pro comfort (8,13)
Belaria® pro compact (8/100/270), (13/100/270)



▨ Area of application heating/domestic hot water heat pump (Belaria® pro comfort and pro compact)

Cooling

Belaria® pro comfort (8,13)
Belaria® pro compact (8/100/270), (13/100/270)



▨ Area of application cooling heat pump (Belaria® pro comfort and pro compact)

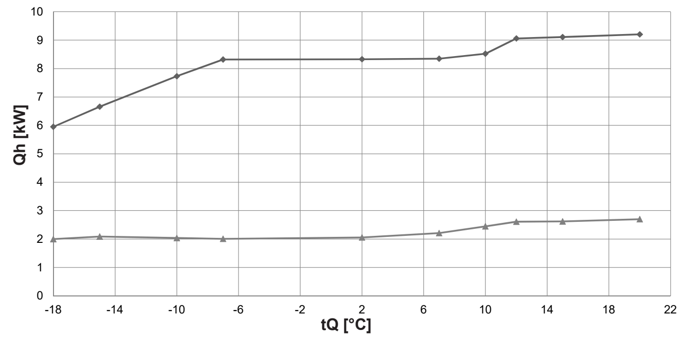
Performance data – heating

Maximum heat output allowing for defrosting losses

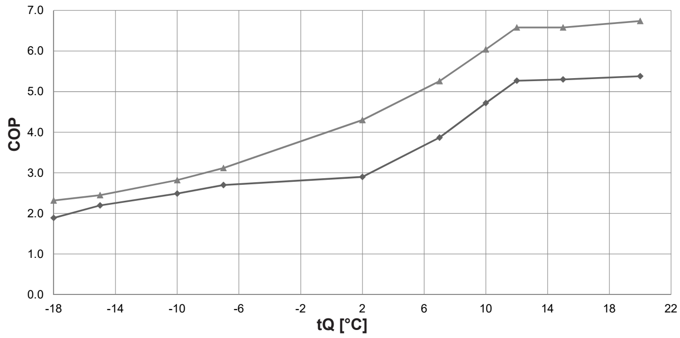
Belaria® pro comfort (8), compact (8/100/270)

Data according to EN 14511

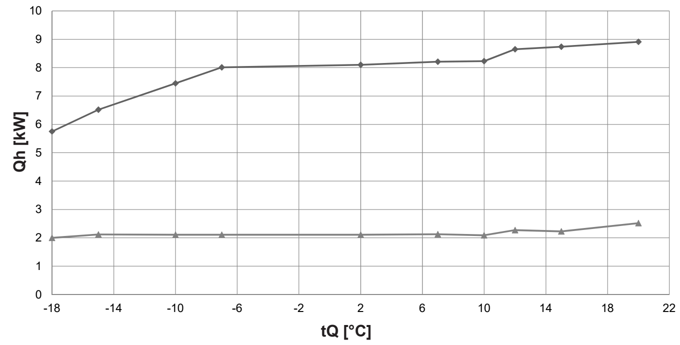
Heat output - t_{FL} 35 °C



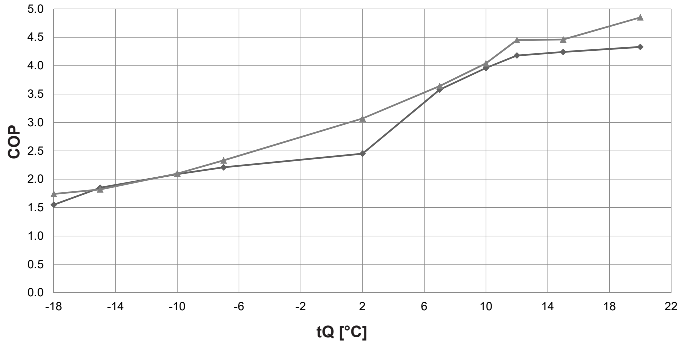
Coefficient of performance - t_{FL} 35 °C



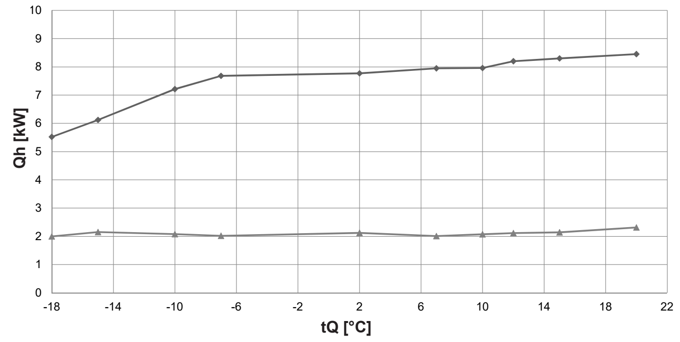
Heat output - t_{FL} 45 °C



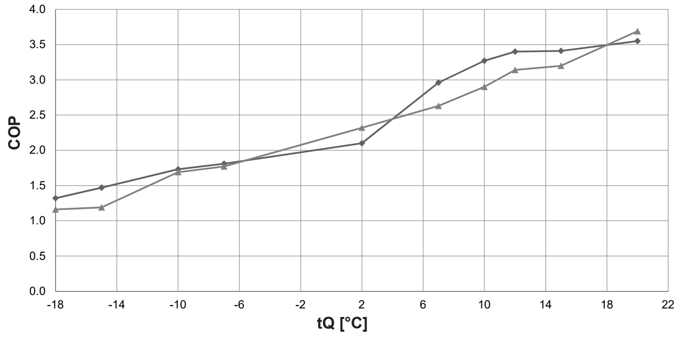
Coefficient of performance - t_{FL} 45 °C



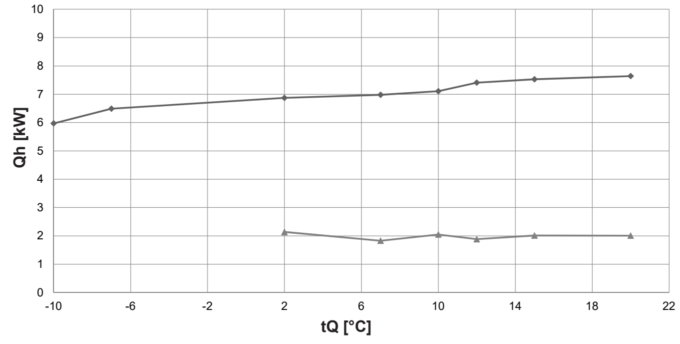
Heat output - t_{FL} 55 °C



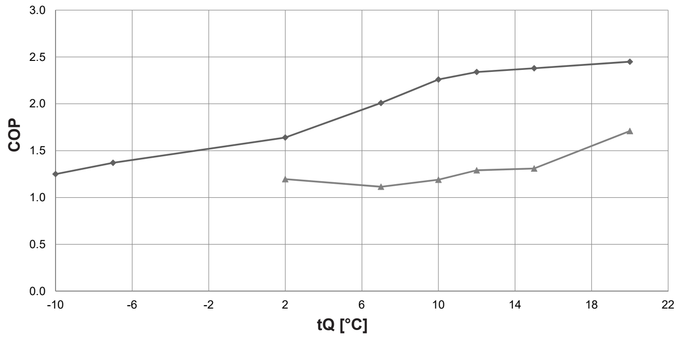
Coefficient of performance - t_{FL} 55 °C



Heat output - t_{FL} 70 °C



Coefficient of performance - t_{FL} 70 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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

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

Performance data – heating

Belaria® pro comfort (8), compact (8/100/270)

Data according to EN 14511

			Maximum output			Minimum output	
tFL °C	tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-18	5.95	3.15	1.89	2.00	0.86	2.32
	-15	6.66	3.03	2.20	2.09	0.85	2.45
	-10	7.73	3.10	2.49	2.04	0.72	2.82
	-7	8.32	3.08	2.70	2.01	0.64	3.12
	2	8.33	2.87	2.90	2.06	0.48	4.30
	7	8.35	2.16	3.87	2.21	0.42	5.26
	10	8.52	1.81	4.72	2.45	0.41	6.04
	12	9.06	1.72	5.27	2.61	0.40	6.58
	15	9.11	1.72	5.30	2.62	0.40	6.58
	20	9.21	1.71	5.38	2.70	0.40	6.74
45	-18	5.75	3.71	1.55	2.00	1.15	1.74
	-15	6.52	3.52	1.85	2.12	1.16	1.82
	-10	7.45	3.56	2.09	2.11	1.00	2.10
	-7	8.01	3.62	2.21	2.11	0.91	2.33
	2	8.10	3.31	2.45	2.11	0.69	3.07
	7	8.21	2.29	3.58	2.13	0.59	3.64
	10	8.23	2.08	3.96	2.09	0.52	4.04
	12	8.65	2.07	4.18	2.27	0.51	4.45
	15	8.74	2.06	4.24	2.23	0.50	4.46
	20	8.91	2.06	4.33	2.52	0.52	4.85
50	-18	5.64	3.93	1.44	2.00	1.38	1.45
	-15	6.32	3.81	1.66	2.14	1.42	1.51
	-10	7.33	3.84	1.91	2.10	1.11	1.90
	-7	7.85	3.90	2.01	2.06	1.01	2.05
	2	7.94	3.49	2.28	2.12	0.79	2.70
	7	8.08	2.47	3.27	2.07	0.66	3.14
	10	8.10	2.24	3.62	2.08	0.60	3.47
	12	8.43	2.22	3.79	2.19	0.58	3.80
	15	8.52	2.23	3.83	2.19	0.57	3.83
	20	8.68	2.20	3.94	2.42	0.57	4.27
55	-18	5.52	4.18	1.32	2.00	1.72	1.16
	-15	6.12	4.16	1.47	2.15	1.81	1.19
	-10	7.21	4.17	1.73	2.08	1.23	1.69
	-7	7.68	4.24	1.81	2.02	1.14	1.77
	2	7.77	3.70	2.10	2.12	0.91	2.32
	7	7.95	2.69	2.96	2.01	0.76	2.63
	10	7.96	2.43	3.27	2.07	0.71	2.90
	12	8.20	2.41	3.40	2.12	0.67	3.14
	15	8.30	2.43	3.41	2.14	0.67	3.20
	20	8.45	2.38	3.55	2.32	0.63	3.69
60	-18	5.37	4.59	1.17	-	-	-
	-15	5.83	4.59	1.27	-	-	-
	-10	6.72	4.54	1.48	2.07	1.49	1.39
	-7	7.39	4.53	1.63	1.97	1.32	1.49
	2	7.57	3.92	1.93	2.13	1.09	1.95
	7	7.64	2.96	2.58	1.95	0.92	2.13
	10	7.76	2.74	2.83	2.06	0.89	2.33
	12	7.98	2.65	3.01	2.04	0.82	2.49
	15	8.08	2.70	3.00	2.10	0.82	2.57
	20	8.22	2.60	3.16	2.21	0.71	3.11
70	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	5.97	4.78	1.25	-	-	-
	-7	6.49	4.74	1.37	-	-	-
	2	6.87	4.19	1.64	2.14	1.79	1.20
	7	6.98	3.47	2.01	1.83	1.64	1.12
	10	7.11	3.15	2.26	2.05	1.72	1.19
	12	7.41	3.17	2.34	1.89	1.46	1.29
	15	7.53	3.16	2.38	2.02	1.54	1.31
	20	7.64	3.12	2.45	2.01	1.18	1.71

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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”

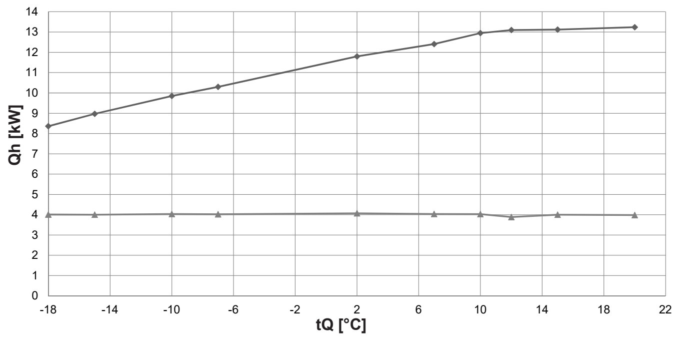
Performance data – heating

Maximum heat output allowing for defrosting losses

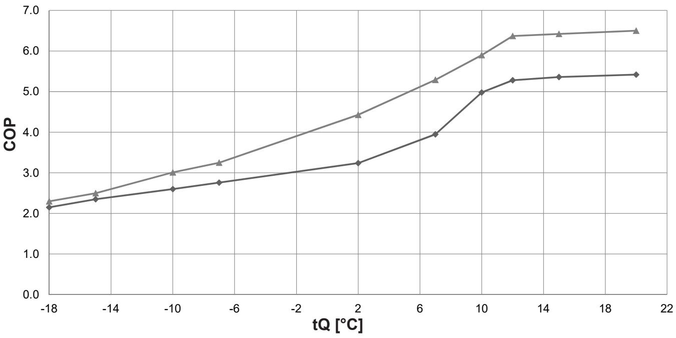
Belaria® pro comfort (13), compact (13/100/270)

Data according to EN 14511

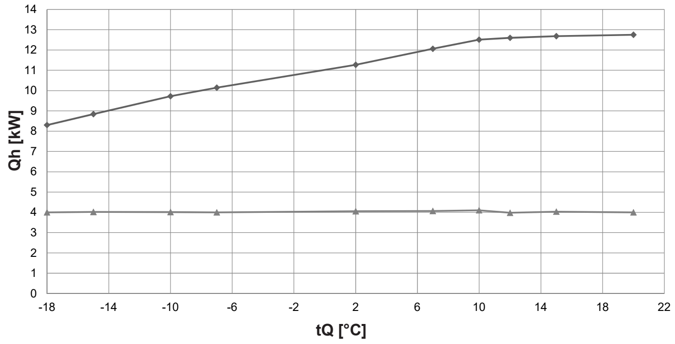
Heat output - t_{FL} 35 °C



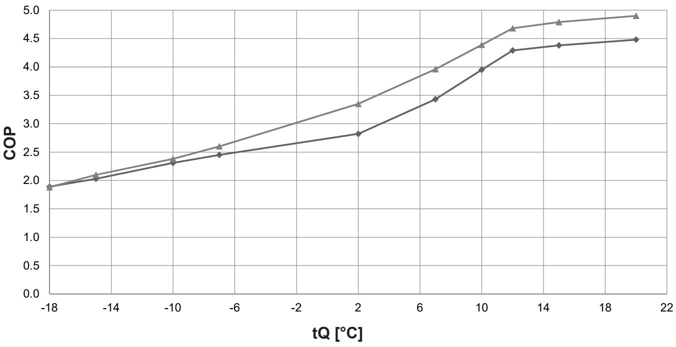
Coefficient of performance - t_{FL} 35 °C



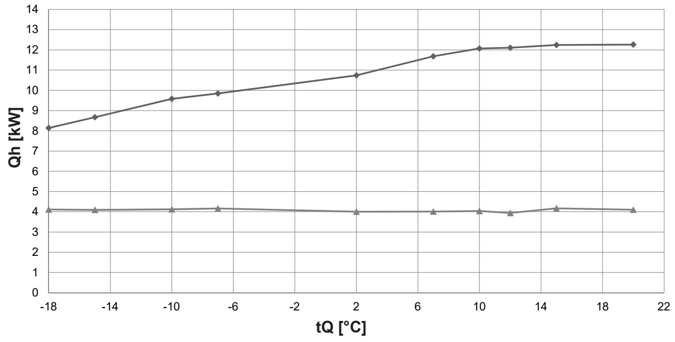
Heat output - t_{FL} 45 °C



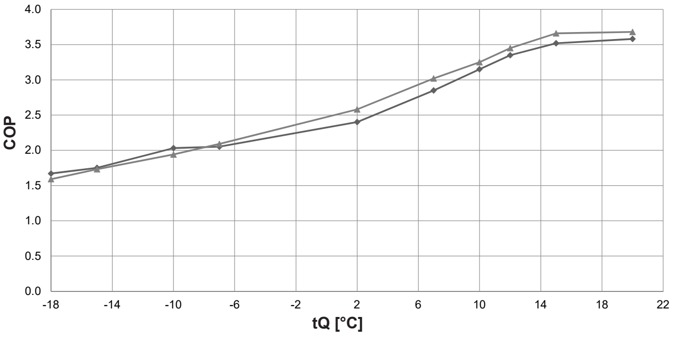
Coefficient of performance - t_{FL} 45 °C



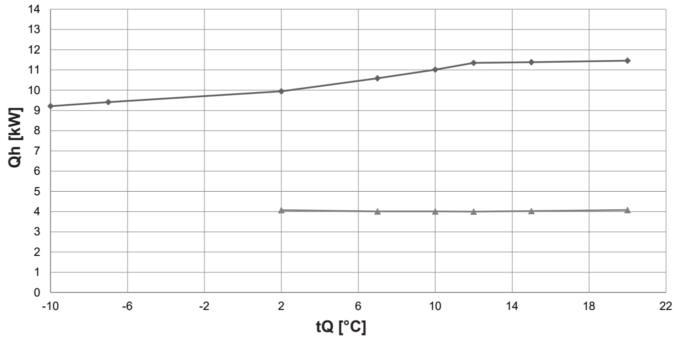
Heat output - t_{FL} 55 °C



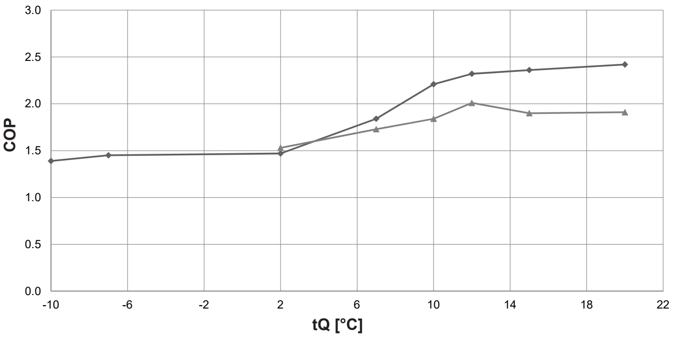
Coefficient of performance - t_{FL} 55 °C



Heat output - t_{FL} 70 °C



Coefficient of performance - t_{FL} 70 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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

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

Performance data – heating

Belaria® pro comfort (13), compact (13/100/270)

Data according to EN 14511

		Maximum output			Minimum output		
tFL °C	**tQ °C**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**
35	-18	8.36	3.89	2.15	4.01	1.74	2.30
	-15	8.97	3.82	2.35	4.00	1.60	2.50
	-10	9.85	3.79	2.60	4.04	1.34	3.01
	-7	10.30	3.73	2.76	4.02	1.24	3.25
	2	11.80	3.64	3.24	4.07	0.92	4.43
	7	12.41	3.14	3.95	4.04	0.76	5.29
	10	12.95	2.60	4.98	4.03	0.68	5.90
	12	13.10	2.48	5.28	3.89	0.61	6.37
	15	13.12	2.45	5.36	4.00	0.62	6.42
	20	13.24	2.44	5.42	3.98	0.61	6.50
45	-18	8.30	4.39	1.89	4.00	2.13	1.88
	-15	8.84	4.35	2.03	4.02	1.91	2.10
	-10	9.72	4.21	2.31	4.01	1.68	2.38
	-7	10.14	4.14	2.45	4.00	1.54	2.60
	2	11.27	4.00	2.82	4.05	1.21	3.35
	7	12.06	3.52	3.43	4.07	1.03	3.96
	10	12.51	3.17	3.95	4.10	0.93	4.39
	12	12.60	2.94	4.29	3.98	0.85	4.68
	15	12.68	2.89	4.38	4.03	0.84	4.79
	20	12.75	2.85	4.48	4.00	0.82	4.90
50	-18	8.22	4.62	1.78	4.06	2.34	1.74
	-15	8.76	4.63	1.89	4.06	2.12	1.92
	-10	9.65	4.45	2.17	4.07	1.88	2.16
	-7	10.00	4.44	2.25	4.08	1.74	2.35
	2	11.01	4.22	2.61	4.03	1.36	2.97
	7	11.87	3.78	3.14	4.04	1.16	3.49
	10	12.29	3.46	3.55	4.07	1.07	3.82
	12	12.35	3.23	3.82	3.96	0.97	4.07
	15	12.46	3.15	3.95	4.10	0.97	4.23
	20	12.51	3.10	4.03	4.05	0.94	4.29
55	-18	8.14	4.87	1.67	4.11	2.58	1.59
	-15	8.67	4.95	1.75	4.09	2.36	1.73
	-10	9.58	4.72	2.03	4.12	2.12	1.94
	-7	9.85	4.80	2.05	4.16	1.99	2.09
	2	10.74	4.48	2.40	4.00	1.55	2.58
	7	11.68	4.10	2.85	4.01	1.33	3.02
	10	12.07	3.83	3.15	4.04	1.24	3.25
	12	12.10	3.61	3.35	3.94	1.14	3.45
	15	12.24	3.48	3.52	4.17	1.14	3.66
	20	12.26	3.42	3.58	4.10	1.11	3.68
60	-18	8.06	5.17	1.56	-	-	-
	-15	8.59	5.33	1.61	-	-	-
	-10	9.43	5.30	1.78	4.12	2.37	1.74
	-7	9.71	5.25	1.85	4.14	2.23	1.86
	2	10.47	5.13	2.04	3.96	1.78	2.23
	7	11.49	4.49	2.56	4.00	1.54	2.59
	10	11.85	4.31	2.75	4.01	1.44	2.78
	12	11.85	4.11	2.88	4.02	1.34	3.01
	15	12.02	3.89	3.09	3.91	1.28	3.05
	20	12.02	3.84	3.13	4.07	1.32	3.09
70	-18	-	-	-	-	-	-
	-15	-	-	-	-	-	-
	-10	9.21	6.63	1.39	-	-	-
	-7	9.42	6.49	1.45	-	-	-
	2	9.94	6.76	1.47	4.07	2.66	1.53
	7	10.59	5.76	1.84	4.01	2.32	1.73
	10	11.02	4.99	2.21	4.01	2.18	1.84
	12	11.35	4.89	2.32	4.00	1.99	2.01
	15	11.38	4.82	2.36	4.03	2.12	1.90
	20	11.46	4.74	2.42	4.08	2.14	1.91

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = Heat output (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

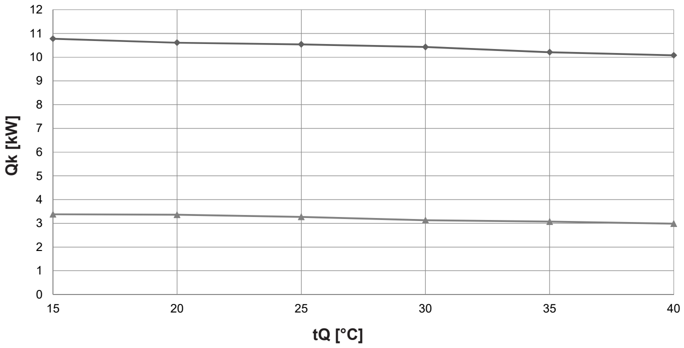
Observe daily power interruptions!
see "Engineering heat pumps general"

Performance data – cooling

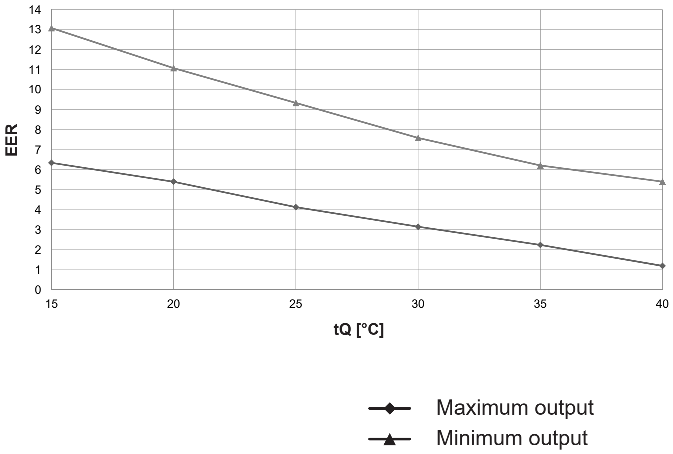
Maximum cooling capacity

Belaria® pro comfort (8), compact (8/100/270)

Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



Belaria® pro comfort (8), compact (8/100/270)

Data according to EN 14511

		Maximum output			Minimum output		
tFL °C	tQ °C	Qk kW	P kW	EER	Qk kW	P kW	EER
7	15	10.74	2.00	5.37	3.03	0.36	8.45
	20	10.16	3.85	2.64	3.07	0.44	6.95
	25	9.61	4.49	2.14	3.11	0.56	5.57
	30	8.80	4.78	1.84	3.11	0.69	4.54
	35	7.87	4.84	1.35	3.10	0.84	3.67
	40	7.06	5.37	1.32	3.30	1.01	3.27
12	15	10.78	1.40	7.67	3.32	0.33	10.21
	20	10.61	3.02	3.51	3.08	0.35	8.74
	25	10.59	4.17	2.54	3.14	0.44	7.07
	30	9.97	4.65	2.14	3.05	0.50	6.06
	35	9.16	5.71	1.60	2.96	0.56	5.26
	40	8.55	5.40	1.58	2.87	0.62	4.61
18	15	10.78	0.96	6.35	3.38	0.26	13.08
	20	10.61	1.96	5.40	3.36	0.30	11.08
	25	10.54	2.55	4.13	3.27	0.35	9.34
	30	10.43	3.31	3.15	3.13	0.41	7.59
	35	10.21	4.56	2.24	3.07	0.49	6.21
	40	10.08	5.41	1.19	2.99	0.55	5.40

tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

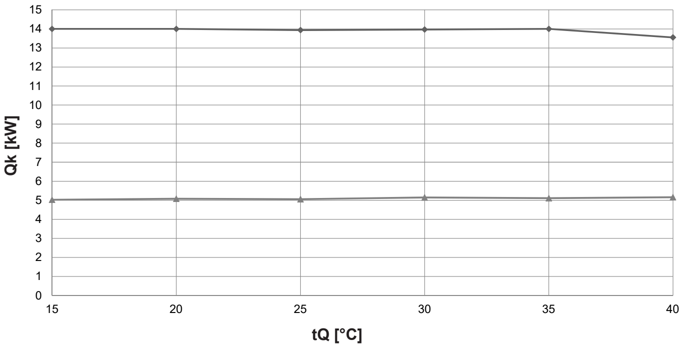
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

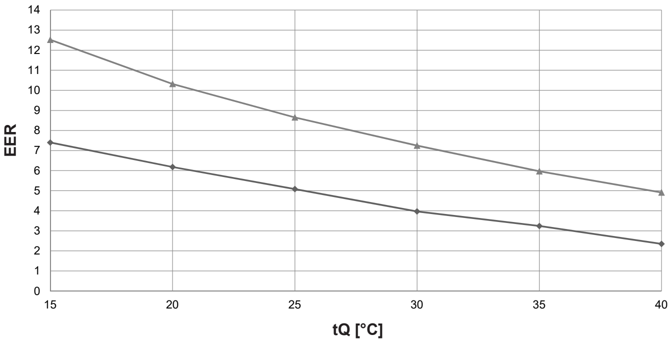
Maximum cooling capacity

Belaria® pro comfort (13), compact (13/100/270)

Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



◆ Maximum output
▲ Minimum output

Belaria® pro comfort (13), compact (13/100/270)

Data according to EN 14511

		Maximum output			Minimum output		
tFL °C	tQ °C	Qk kW	P kW	EER	Qk kW	P kW	EER
7	15	13.96	3.93	3.55	5.04	0.62	8.13
	20	13.40	4.44	3.02	5.06	0.77	6.53
	25	12.71	4.83	2.63	5.08	0.95	5.34
	30	11.79	5.08	2.32	5.08	1.18	4.31
	35	10.79	5.53	1.95	5.07	1.44	3.51
	40	9.49	5.72	1.66	5.09	1.82	2.80
12	15	14.00	2.76	5.07	5.02	0.52	9.53
	20	14.00	3.48	4.02	5.06	0.64	7.93
	25	14.00	4.49	3.12	5.06	0.75	6.65
	30	13.35	4.94	2.70	5.11	0.90	5.70
	35	12.56	5.41	2.32	5.09	1.08	4.64
	40	11.50	5.75	2.00	5.12	1.32	3.88
18	15	14.00	1.89	7.40	5.03	0.40	12.52
	20	14.00	2.27	6.18	5.08	0.49	10.32
	25	13.94	2.74	5.08	5.06	0.58	8.65
	30	13.97	3.52	3.97	5.15	0.71	7.25
	35	14.00	4.32	3.24	5.11	0.86	5.97
	40	13.55	5.77	2.35	5.16	1.05	4.91

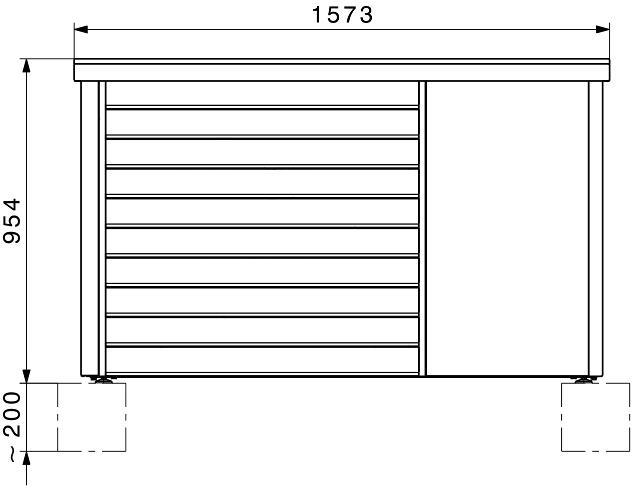
tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

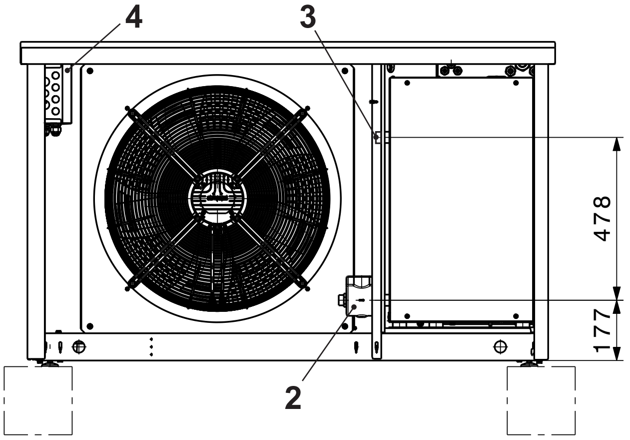
Observe daily power interruptions!
see "Engineering heat pumps general"

Belaria® pro
Outdoor unit

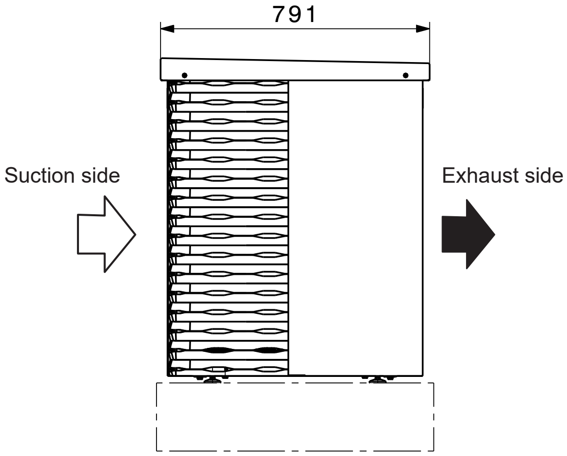
(Dimensions in mm)

Front view

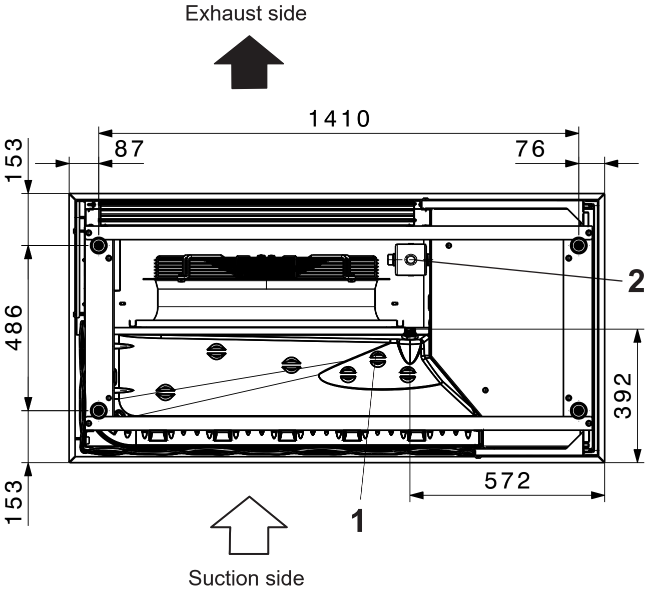




View from the left



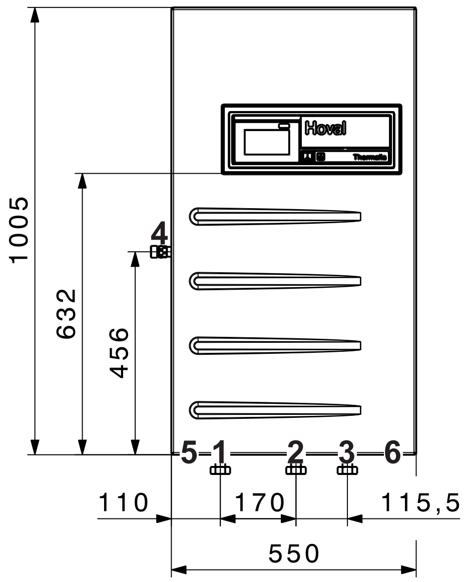
View from below

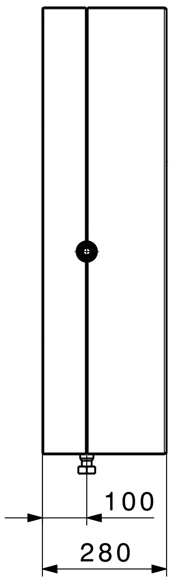


1 Condensate drain Ø 28 mm
2 Connection hydraulic connection line return 1″ ext. thread
3 Connection hydraulic connection line flow 1″ ext. thread
4 Electrical connection

Belaria® pro comfort (8,13)
Indoor unit

(Dimensions in mm)

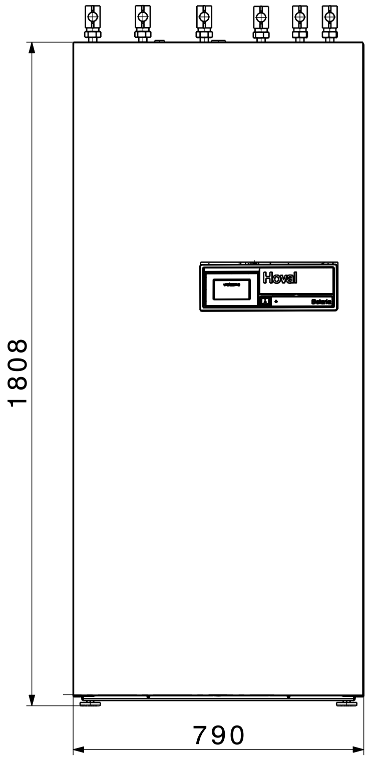




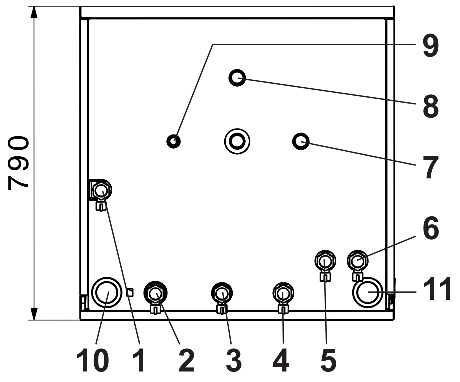
1 Flow outdoor unit 1″ ext. thread (return not guided through indoor unit)
2 Flow heating 1″ ext. thread
3 Flow hot water charging 1″ ext. thread
4 Safety assembly (accessories)
5 Cable feed-in sensors, RS485
6 Cable feed-in main current, control current

Belaria® pro compact (8/100/270), (13/100/270)
Indoor unit with buffer storage tank and calorifier

(Dimensions in mm)



View from above

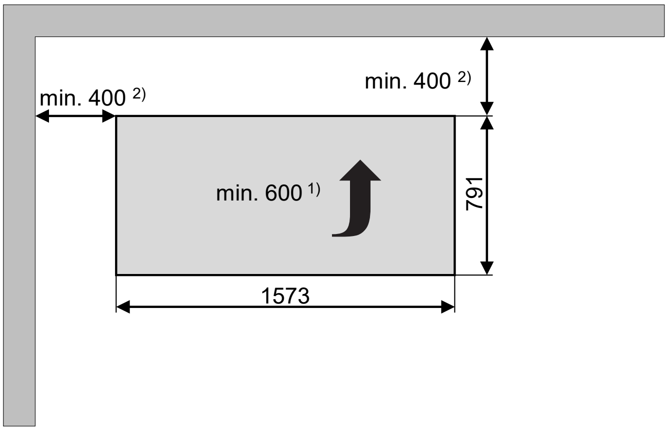


1 Outdoor unit flow 1″ int. thread
2 Outdoor unit return 1″ int. thread
3 Flow second heating circuit 1″ int. thread (optional)
4 Return second heating circuit 1″ int. thread (optional)
5 Flow heating circuit 1″ int. thread
6 Return heating circuit 1″ int. thread
7 Hot water connection ¾″ int. thread
8 Cold water connection 1″ int. thread
9 Circulation connection ¾″ ext. thread
10 Cable feed-in sensors, RS485
11 Cable feed-in main current, control current

Space requirement

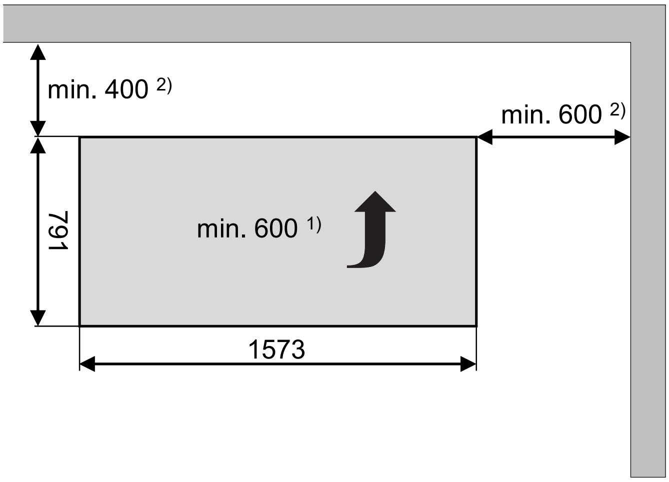
(Dimensions in mm)

Belaria® pro
wall corner left
Outdoor unit



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

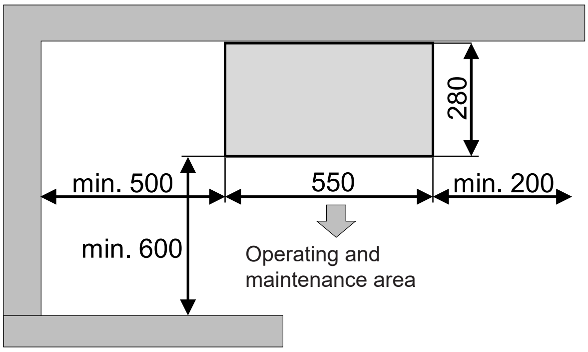
Belaria® pro
Wall corner right
Outdoor unit



[1] In order to ensure accessibility during maintenance, a clearance of at least 600 mm upwards must be maintained.

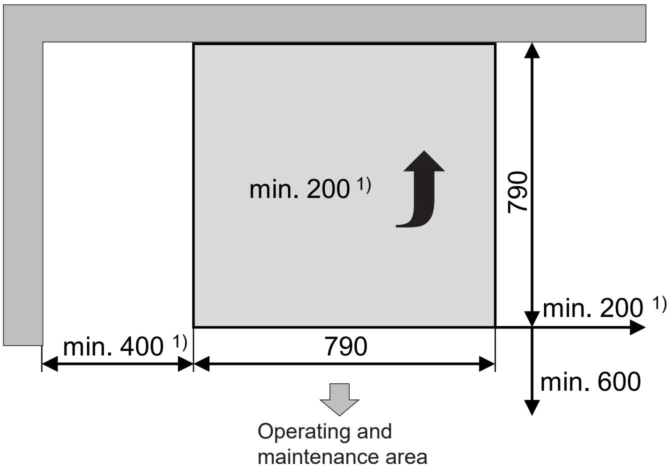
[2] For any service work, the minimum clearances at the rear and sides of the heat pump must be observed.

Belaria® pro comfort (8,13)
Indoor unit wall-mounted



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

Belaria® pro compact (8,13/100/270)
Indoor unit floor-mounted

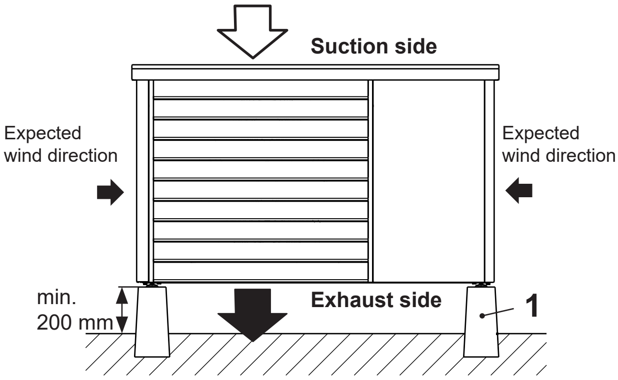


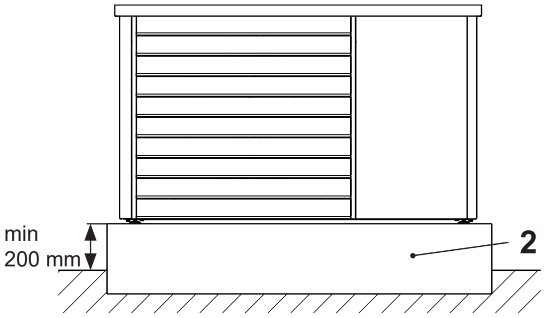
[1] To ensure accessibility to the electrical/hydraulic connections, a clearance of at least 200 mm must be provided above the indoor unit. In addition, the side clearances must be observed.

Installation variants for Belaria® pro outdoor unit

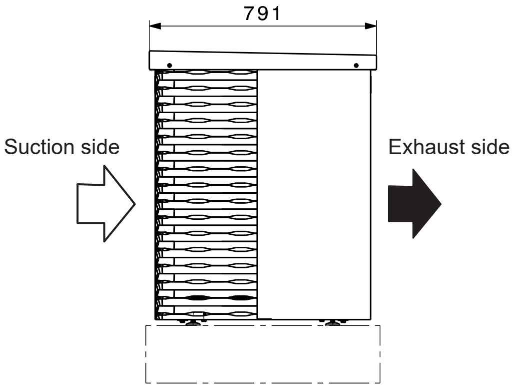
(Dimensions in mm)

Firm base on site





View from the left



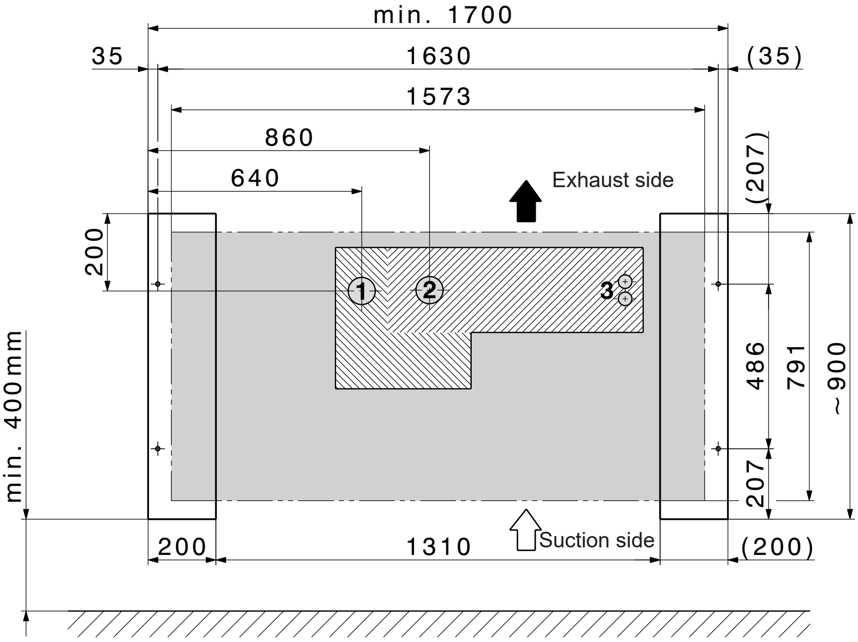
1 Concrete base on site
2 Floor plate on site

Installation variants for Belaria® pro outdoor unit

(Dimensions in mm)

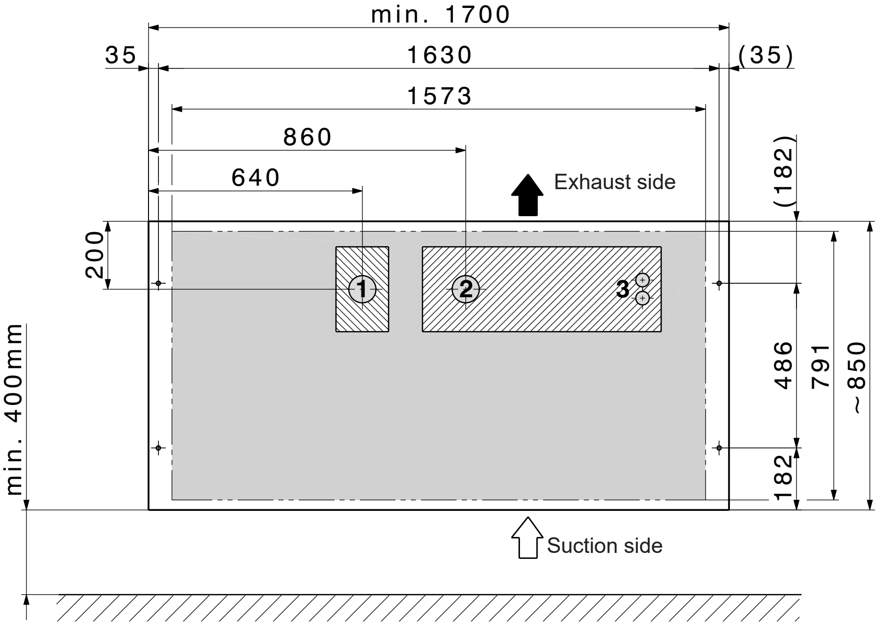
Strip foundation

Plan concrete base set
(view from above)



Floor plate

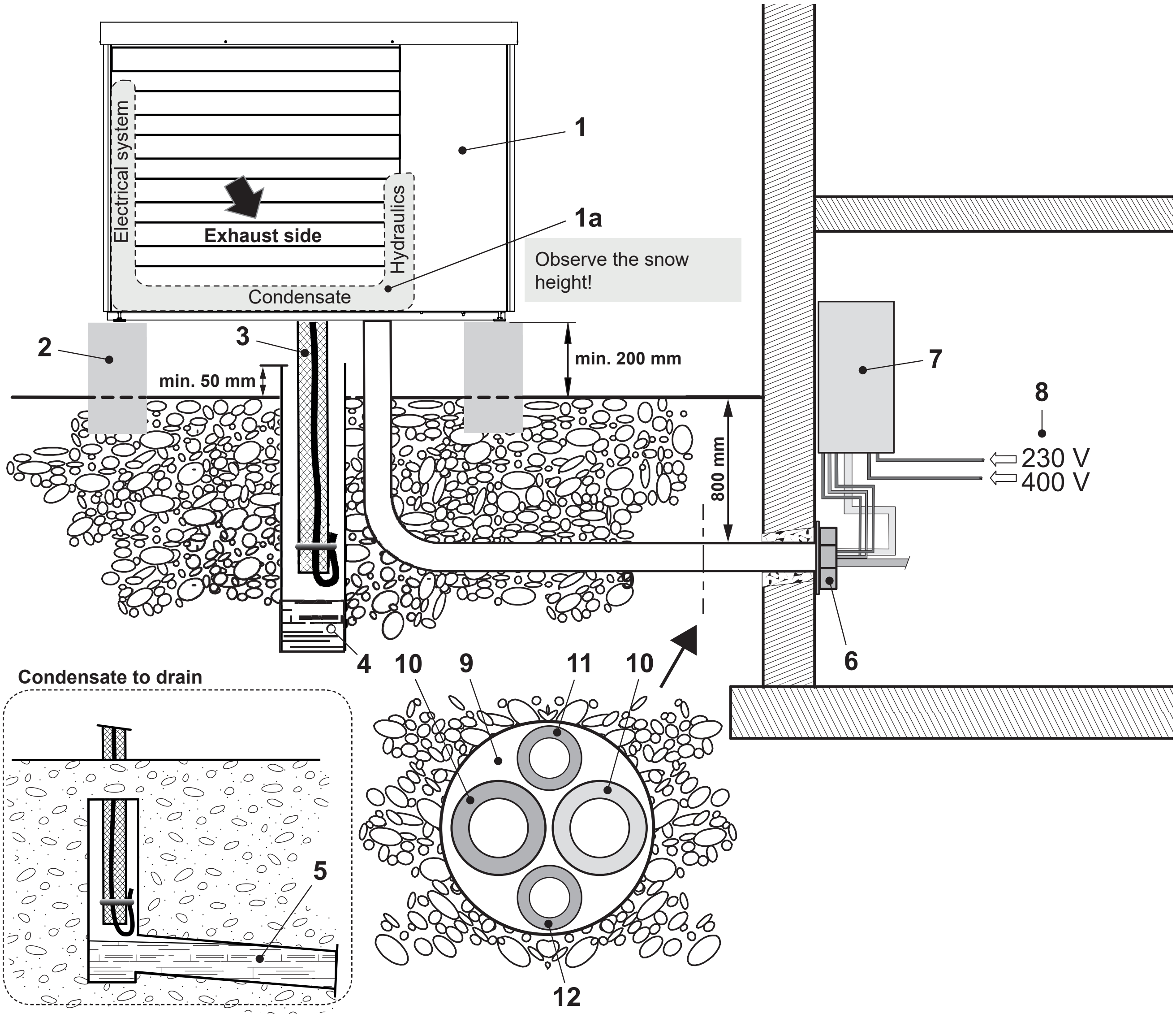
Plan
(view from above)



1. Optimum position for condensate drain DN 100
2. Optimum position for empty tube for hydraulic and, if necessary, electric connection line. Upper edge of empty tube 50 mm above concrete base level.
3. Optimum position for empty tube 2 x DN 32 with separate routing of the electrical lines.
   1. 230 V and 400 V
   2. RS485
4. Attachment points M8 Belaria® pro (dowels in scope of delivery)

▨	Possible area for empty tubes in the concrete base
▧	Possible area for condensate drain in the concrete base

Configuration and connection diagram Belaria® pro



1 Outdoor unit
1 a Space for connection of hydraulics (FL+RT), condensate drain and electrics.
2 Concrete base
3 Condensate drain Ø 28 mm
4 Variant 1: Seepage (duct/gravel layer)
5 Variant 2: Discharging into the drain (penetration into the soil must be made leak-tight)
6 Wall bushing
(hydraulic and electrical connections)
7 Belaria® pro comfort indoor unit (8,13)
- On the Belaria® pro compact (8,13/100/270), the hydraulic and electrical connections are located on the top of the unit!

8 Main current
3 x 400 V / 50 Hz
Control current
1 x 230 V / 50 Hz
Electric heating element main current
3 x 400 V / 50 Hz
Network cables (optional)
9 Empty tube for hydraulics and electrics
10 Connection line FL + RT
11 Empty tube for electrical connections for outdoor unit
Main current outdoor unit 3 x 400 V / 50 Hz
Outdoor unit control current 1 x 230 V / 50 Hz
12 Empty tube for data bus RS485

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

Set-up
- The distance between the indoor and outdoor unit must be as short as possible. Only short and simple routing of lines guarantees cost effectiveness and low heat losses.
- The maximum permissible length of the DN 25 lines between the outdoor and indoor unit is 30 m and must not be exceeded. If the Belaria® pro (13) is operated as a direct circuit, DN 32 connection lines must be selected if the 30 m line length is required.
- There must be no building openings (windows, doors, shafts, ventilation openings, etc.) within a radius of 1 m from the outdoor unit and no potential ignition sources must be present.
- Wall ducts into the building must be airtight.
- The outdoor unit must not be placed in or near floor recesses.
- No installation on roofs or on the wall (wall mounting)
- The outdoor unit must not be placed closer than one metre to the boundary of the property.
- 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 (> 3 m).
- Due to efficient water heating, the line length with the Belaria® pro comfort between the calorifier and the indoor unit is not allowed to be more than 10 m.

Outdoor unit
The outdoor unit is installed outdoors. The installation location must be selected carefully. It is essential that the following ancillary conditions are met:
- The maximum line length according to the installation must not be exceeded.
- The connection lines must be laid insulated and frost-proof.
- The installation location must be chosen in such a way that no noise pollution can occur (do not install near bedrooms, keep a distance from neighbours), hedges and bushes can have a sound-absorbing effect.
- Unobstructed air inflow and outflow must be possible.
- It is imperative that the minimum distances are observed (see Dimensions/Space requirement)
- The intake air must be free of impurities such as sand and aggressive substances such as ammonia, sulphur, chlorine etc.
- The outdoor unit must be installed on a load-bearing fixed structure.
- If the unit is installed at wind-prone locations, the alignment of the heat pump must be selected in such a way that the expected wind direction is crossways to the suction direction of the outdoor unit.
- If it is not possible to install in areas subject to strong winds, 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 M8 screws.
- Air heat pumps generate condensation during operation. This can amount to 15 litres per defrost cycle within 2 minutes for the outdoor unit of the Belaria® pro.
- The condensate drain must be protected against frost.
- If the discharge is into the sewage system, a siphon must be provided or the duct lead-through into the ground must be sealed so that no refrigerant can enter the sewage system uncontrolled.
- The condensate trough included in the outdoor unit is already equipped with a tank heater at the factory and thus prevents freezing.
- The condensate drain line is also secured with the preassembled heating tape.
- The air outlet has increased susceptibility to frost. Gutters, water pipes and water containers must not be situated right next to the outlet.
- If installed near the coast, the location must be at least 5 km from the coastline. If this safe distance is not complied with, increased corrosion can be expected. These cases are excluded from the warranty.
- To prevent damage caused by animals such as rodents or insects, all cable ducts must be properly sealed.

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

The installation of a magnetic sludge separator or a system water protection filter is mandatory.

Electrical connections
- The electrical connection must be carried out by a qualified technician and registered with the responsible energy supply company. The relevant electrical installation company is responsible for ensuring that electrical connection is carried out in accordance with standards and that safeguard measures are put in place.
- The mains voltage at the connection terminals of the heat pump must be 400 V or 230 V +/-10%. The dimensions of the connection line must be checked by the electrical company carrying out the work.
- A fault-current circuit breaker is recommended. A “zeroing TN-S” can be used instead of the RCCB type B. Country-specific requirements must be complied with. If the “fault-current circuit breaker” safeguard measure is implemented nevertheless 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 connection and feeder lines must be copper cables.
- Please refer to the wiring diagram for electrical details.
- The wall feedthrough should slope down from the inside to the outside.
- To avoid damage, the opening should be padded on the inside or, for example, lined with a PVC pipe.
- After installation, the wall opening must be sealed with a suitable sealing compound on site, observing the fire protection regulations.

Routing of the hydraulic connection lines

- If the hydraulic connection lines are laid in the ground, this must be done in a protective tube. For example, this can be a PVC pipe with a diameter of 150 mm.
- Wall ducts must be sealed to the outside on site.
- After the hydraulic connection lines have been laid, they must be checked for damage and reinsulated. In case of cooling, condensate can form on the pipes.
- The hydraulic connection lines must be laid decoupled from the building and must never be laid flush-mounted.
- Care must be taken to ensure that water pipes do not pass through the sleeping or living areas.
- Shut-off valves must be installed on site in accordance with the corresponding hydraulic diagram. The shut-off valves are not allowed to be opened until immediately before commissioning.

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.

Further guidelines
see “Engineering”

Connection on drinking water side

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

Installation on heating side

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

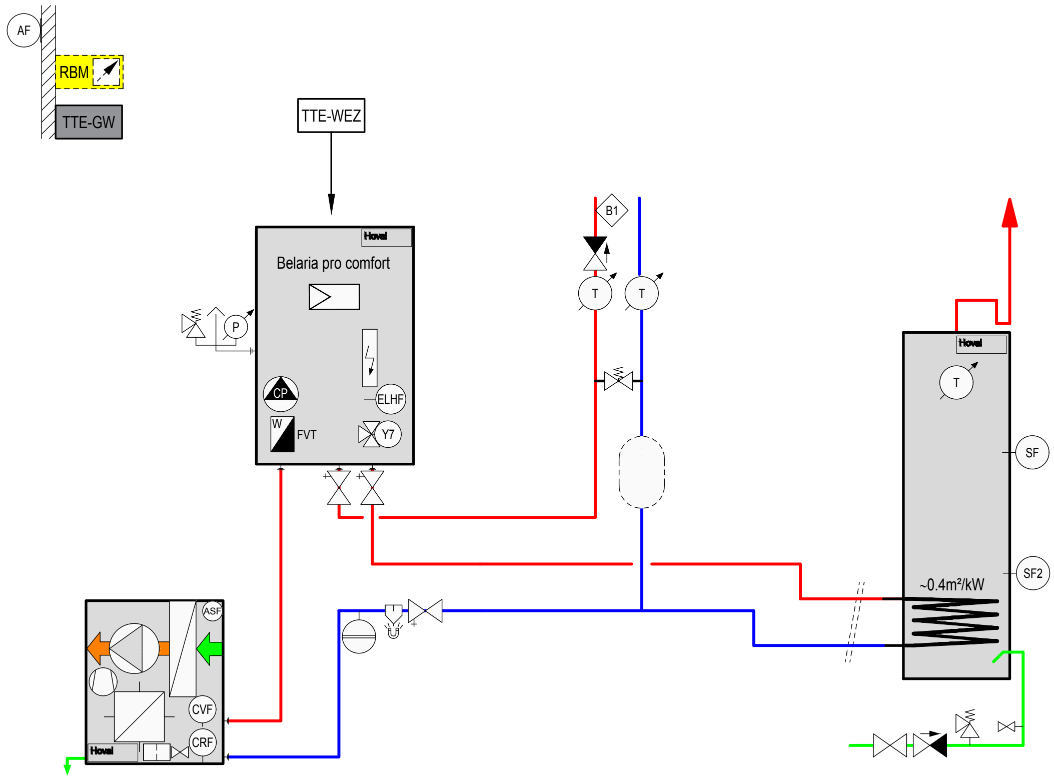
Transport and storage

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

Belaria® pro comfort

Air/water heat pump with
- calorifier
- 1 direct circuit

Hydraulic schematic BBALE010



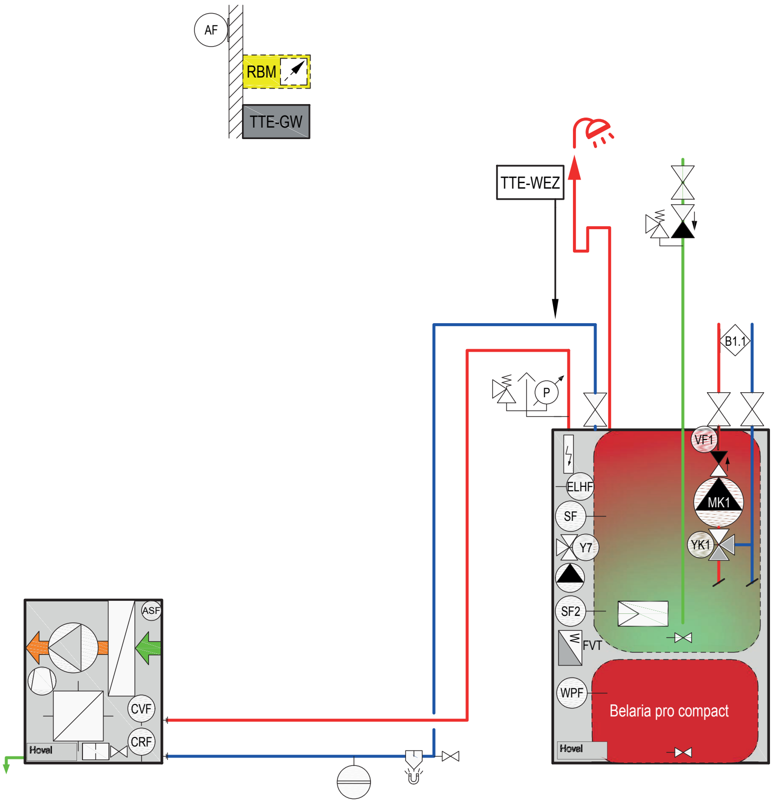
Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

AF	Outdoor sensor
ASF	Intake sensor
B1	Flow temperature monitor (if required)
CP	Condenser pump
CRF	Condenser return sensor
CVF	Condenser flow sensor
ELF	Sensor for electric heating element
SF	Calorifier sensor
SF2	Calorifier sensor 2
TTE-WEZ	TopTronic® E basic module heat generator (installed)
W	Flow sensor (FVT)
Y7	Switching valve
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E gateway

Belaria® pro compact

Air/water heat pump with
- integrated calorifier
- integrated buffer storage tank
- 1 mixer circuit

Hydraulic schematic BBAME010



AF	Outdoor sensor
ASF	Intake sensor
B1	Flow temperature monitor (if required)
B1.1	Flow temperature monitor (if required)
CP	Condenser pump
CRF	Condenser return sensor
CVF	Condenser flow sensor
ELF	Sensor for electric heating element
MK1	Pump mixer circuit 1
SF	Calorifier sensor
SF2	Calorifier sensor 2
TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow sensor 1
W	Flow sensor (FVT)
WPF	Heat pump buffer sensor
Y7	Switching valve
YK1	Actuator mixer 1
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E gateway

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

Hoval Belaria® SRM
Hoval Belaria® compact SRM
Modulating heat pump system for heating and cooling in the living area

Split system comprising indoor unit
and outdoor unit.
Modulation range 30 % to 100 %

Seal of approval FWS
The Belaria® SRM (4-8) series is certified by the seal of approval of the authorisation commission of Switzerland

The built-in high-efficiency pumps fulfil the Ecodesign requirements of 2015 with an EEI of ≤ 0.23.

Model range

Belaria® SRM Belaria® compact SRM Type	35 °C	55 °C		Heat output A-7W35 kW	Heat output A2W35 kW	Cooling capacity A35W18 kW
(4)	A^{+++}	A^{++}	A	4.6	4.8	5.9
(6)	A^{++}	A^{++}	A	5.3	6.4	7.3
(8)	A^{++}	A^{++}	A	6.4	7.7	8.4

Energy efficiency class of the compound system with control
Performance data at nominal output

Indoor unit Belaria® SRM
- Compact unit for wall installation
- Casing made from painted, galvanised sheet steel. Colour pure white (RAL 9010).
- Condenser stainless steel/Cu
- Speed-controlled high-efficiency pump
- Pressure expansion tank 10 litres
- Pressure gauge
- Flow sensor
- Cut-off valves for heating flow and return (included separately)
- Emergency heating
  Belaria® SRM (4) 3 kW
  Belaria® SRM (6-8) 3/9 kW
  (see also technical data) with
  safety thermostat, safety valve
- Strainer, air-bleeding valve, overpressure valve
- Controller with heating, cooling and calorifier function (operating unit included separately)
- With cooling function through inversion of cycle
- Electrical box
- Flow and return sensor installed
- Filling and drain valve

Belaria® compact SRM indoor unit
- Compact floor-standing unit
- Casing made from painted, galvanised sheet steel. Colour RAL 9010 (pure white).
- Condenser stainless steel/Cu
- Stainless steel calorifier installed
  Belaria® compact SRM (4) 180 litres
  Belaria® compact SRM (6-8) 260 litres
- Speed-controlled high-efficiency pump
- Pressure expansion tank 10 litres
- Pressure gauge
- Flow sensor
- Cut-off valves for heating flow and return (included separately)
- Emergency heating
  Belaria® compact SRM (4) 3 kW
  Belaria® compact SRM (6-8) 3/9 kW
  (see also technical data) with
  safety thermostat, safety valve
- Strainer, air-bleeding valve, overpressure valve
- Controller with heating, cooling and calorifier function (included separately)
- With cooling function through inversion of cycle
- Electrical box
- Flow and return sensor installed
- Filling and drain valve

Outdoor unit
- Compact unit for outdoor installation
- Casing made from painted, galvanised sheet steel, colour beige/grey (similar to RAL 7044)
- Speed-controlled compressor
- 1 / 2 speed-controlled fans
- Coated Alu/Cu finned-tube evaporator
- Electronic expansion valve
- Four-way valve
- Filled with refrigerant R 410 A
- Shut-off valves on the refrigerant side
- Outdoor sensor installed

Connections, heating/cooling
- Heating connections
  Indoor unit Belaria® SRM (4-8)
  bottom, indoor unit Belaria®
  compact SRM (4-8) top
- 2 cut-off valves included separately

Connections, refrigerant connection line
- Indoor unit Belaria® SRM (4-8) bottom, indoor unit Belaria® compact SRM (4-8) top
- Outdoor unit on the right side
- Hot gas line 15.9 mm (⅝″)
  liquid line:
  Belaria® SRM,
  compact SRM (4-8) 6.4 mm (¼″)

Condensate drain
- Free run-off of the condensate for draining off
- An optional condensate drip tray for collective discharge of the condensate is available

Electrical connections
- Outdoor unit on the right side
  connection:
  Belaria® SRM, compact SRM (4-8) 230 V
- Indoor unit is fed from the outdoor unit
- Emergency heating is connected to the indoor unit separately
- Electric heating element connection in the external calorifier 1 x 400 V (Belaria® SRM (4-8))

Delivery
- Inside and outdoor unit delivered packaged separately.
- Both cut-off valves are included separately with the indoor unit.
- Sensor for calorifier supplied loose in the indoor unit (Belaria® SRM (4-8))

On site
- Installation of the insulation set (Belaria® SRM)
- Installation of the collective alarm board
- Wall openings for refrigerant connecting lines.
- Electr. connecting line outside/indoor unit

Part No.

Air/water heat pump system

Hoval Belaria® SRM
Hoval Belaria® compact SRM

Modulating heat pump system for heating and cooling. Comprising inside and outdoor unit. Belaria® compact SRM with integrated calorifier in the indoor unit.

Belaria® SRM Type	Heat output kW A-7W35	Heat output kW A2W35	Cooling capacity kW A35W18	Part No.
(4)	4.6	4.8	5.9	7013 709
(6)	5.3	6.4	7.3	7013 710
(8)	6.4	7.7	8.4	7013 711

Belaria® compact SRM Type	Calorifier litres	Heat output kW A2W35	Cooling capacity kW A35W18	Part No.
(4)	180	4.8	5.9	7013 715
(6)	260	6.4	7.3	7013 716
(8)	260	7.7	8.4	7013 717

Energy efficiency class
see Description

Hose set SH25-25-10-2 6024 913
for Belaria® SRM (4-8)
Prevents vibrations of the heating pump on the heating network
Consisting of:
2 pcs. flexible hoses DN 32, L=1.5 m
2 pcs. reduction nipple R 1¼″ x RG 1″
2 pcs. seals

Part No.

Accessories

Room station
Additional controller as room station
same function as controller
on the unit (cable connection)

6043 816

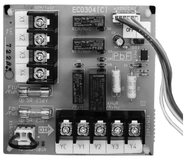
Room thermostat with remote control

RS-W (cable connection) — 6023 044

RS-R (with radio transmission) — 6023 045

Outside temperature sensor
additional outside temperature sensor
necessary if the outside unit is placed
in an unfavourable position
(exposure to sunlight)

2053 179



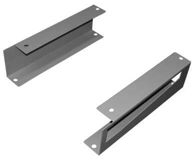
Additional board (A4P/A7P)
Digital input/output board for:
- Alarm output
- Changeover to external heat source

6019 357

Notice
Only use a condensate drip tray if it is absolutely necessary. If the condensation can flow away unobstructed, no condensate drip tray will be required.

Condensate drip tray cpl. w/ A4P board
for Belaria® SRM and compact SRM (4-8)
for collection of the condensate under
the outdoor unit
Material: UV-resistant plastic
Tray heater 120 W, 230 V with thermostat
with additional protection
Condensate outlet: Outside - Ø 38 mm
Dimensions: 960 x 420 x 40 (LxWxT)
For mounting on socket, the vibration
dampers have to be ordered separately.
digital on/off board for:
- energetic control of the heating tape

6033 389



Notice
When ordering the concrete base sets BSW01-FU or BSW01-FD, it is mandatory to order as well a base for the outdoor unit.

Base for outdoor unit
for Belaria® SRM and
compact SRM (4-8)
Comprising:
2 U-irons painted
Mandatory for outdoor unit
on concrete base.
(Exception: for installation on
wall console)
Base must be mounted above the
condensate drip tray.

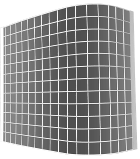
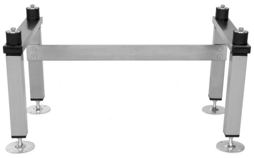
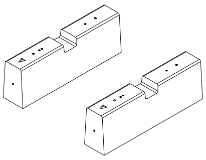
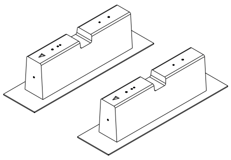
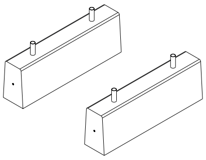
6031 247

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

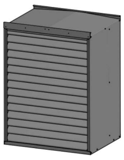
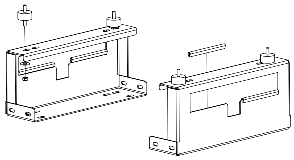
A digital on/off board for (A4P/A7P) must be ordered as well for an energetic control.

6033 374

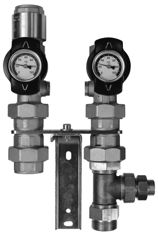
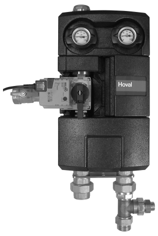
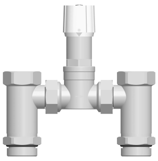
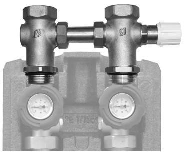
Accessories

		Part No.
	**Protective roof for outdoor unit** for Belaria® SRM, compact SRM (4-8) Material: Aluminium powder-coated Colour: silk grey RAL 7044 Can also be combined with wall bracket for outdoor unit.	6040 215
	**Protective grid for outdoor unit** for Belaria® SRM and compact SRM (4-8) sturdy grid for protection of the evaporator Material: coated stainless steel (RAL 7044) Mounting on site	6031 613
	**Wall console for outdoor unit** for Belaria® SRM and compact SRM (4-8) for attachment of the unit to the wall 2 brackets made of steel sheet incl. vibration dampers and fixing material Attention: Cannot be used in this form on insulated walls! Not suitable for lightweight walls!	6031 530
	**Stand bracket** for Belaria® SRM and compact SRM (4-8) for mounting the unit on the floor incl. vibration damper Dimensions: 300 x 620 x 300 (L x W x H) Weight: 6.5 kg	6040 354
	**Concete base set BSW01-FU** to securely erect an outdoor unit on solid ground. Consisting of: 2 concrete bases with molded fastening sleeves, screw set Weight: 2 pieces of 58 kg	6046 157
	**Concrete base set BSW01-FD** to securely erect an outdoor unit on flat roof. Consisting of: 2 concrete bases with molded fastening sleeves, protective mats with aluminium facing, screw set Weight: 2 pieces of 58 kg	6046 158
	**Concrete base set BSW01-ZS** to securely erect an outdoor unit in drainage bed for gardens and meadows. Additional base height 250 mm for plug combination with set BSW01-FU Consisting of: 2 additional concrete bases, screw set Weight: 2 pieces of 58 kg	6046 159
	**Vibration damper** for Belaria® SRM and compact SRM (4-8) for installing the unit on a concrete base (on site). 4 pieces incl. dowels HKD-S M8x30, washers and nuts	6022 489

Accessories

		Part No.
	**Sound attenuation housing SDG01** for Belaria® SRM and compact SRM (4-8) for reducing the noise level of the unit set up outdoors Protects the unit against all weather influences Material: steel with aluminium zinc coating Colour: grey (similar to RAL 9006) Dimensions: 1065 x 1200 x 900 (HxWxD) Sound attenuation between 5 and 10 dB(A) depending on installation and ambient conditions Base set SDG01 must be ordered as obligatory accessory	6040 356
	**Base set SDG01** for sound attenuation housing SDG01 Overall height: 250 mm Consisting of: 2 U-shaped brackets, coated 4 vibration dampers Must be ordered as accessory for use with sound attenuation housing SDG01	6042 937
	**Condensate drip tray KWD - SD housing** acoustig insulation housing for Belaria® SRM and compact SRM (4-8) for collection of the condensate under the outdoor unit in the acoustic insulation housing SDG01 and SDG02 With drain port for hose connection Without support heating strip	6040 344
	**Insulation set (indoor unit)** for Belaria® SRM (4-8) Required to prevent the temperature falling beneath the dewpoint in cooling mode with flow temperatures below +20 °C	6031 249

Accessories

		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 expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
	**Connection set AS32-2/ HW** for compact mounting of all required fittings of a direct circuit and hot water charging Consisting of: Fully assembled armature group with 2 thermometer ball valves Thermal insulation box made of EPP half-shells 3-way motor valve 2-LR230A included separately Connection T-piece DN 32 in the return flow for connecting the sludge separator CS 32 bottom and the expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 794
	**Bypass valve DN 25 (1″)** for installation on a HA group DN 25 Pressure range 0.1 - 0.6 bar	6046 875
	**Bypass valve DN 32 (1¼″)** for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m^3/h with self-sealing screw connection for mounting between flow and return ball valve	6014 849

Overflow valves must close completely
under the set pressure.

Notice:
Fulfills the function of sludge separator and strainer

	Part No.
System water protection filter Type: 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 loss. 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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: ($\Delta p<0.1$ bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C	2076 374

Strainers
see “Various system components”

Switching ball valve VBG60..
DN 15-50, PN 16, 120 °C

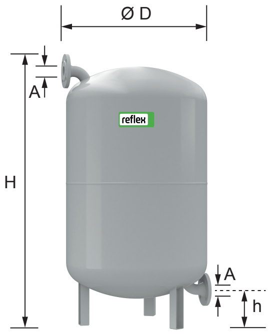
- Three-way ball valve made of brass with threaded connection
- incl. seals and screw connections

DN	Connection	kvs m^3/h	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445

Suitable motor drive

Type	Voltage	Control signal	Actuator run time	Part No.
GLB341.9E	230 V / 50/60 Hz	2-/3-point	150 s	2070 331

Circulating pumps, actuators, buffer storage tanks
see separate brochures



Reflex V40
In-line vessel made of sheet steel,
Designed for operating overpressures up to 10 bar.

Reflex type	Ø D mm	H mm	h mm	A	Part No.
V 40	409	562	113	R 1″	2057 249

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® SRM (4-8)
Belaria® compact SRM (4-8)

Type		SRM (4)	SRM (6)	SRM (8)
Max. performance data heating and cooling in acc. with EN 14511				
• Max. heat output A2W35		4.8	6.4	7.7
• Max. heat output A-7W35		4.6	5.3	5.8
• Max. cooling capacity A35W18		5.9	7.3	8.4
• Max. cooling capacity A35W7		4.5	5.5	6.4
Nominal performance data heating and cooling in acc. with EN 14511				
• Nominal heat output A-7W35 [2]	kW	4.6	5.4	6.4
• Output rating A-7W35 [2]	COP	2.8	2.9	2.8
• Nominal heat output A2W35 [2]	kW	3.3	4.7	5.8
• Output rating A2W35 [2]	COP	4.0	3.8	3.7
• Nominal heat output A10W35 [2]	kW	4.5	6.3	7.4
• Output rating A10W35 [2]	COP	5.3	5.2	4.9
• Nominal cooling capacity A35W18 [1]	kW	5.9	7.3	8.4
• Output rating A35W18 [1]	EER	3.2	3.2	2.9
• Nominal cooling capacity A35W7 [1]	kW	4.5	5.5	6.4
• Output rating A35W7 [1]	EER	2.2	2.2	2.0
Dimensions				
• Outdoor unit H/W/D	mm	735/832/307		
• Indoor unit H/W/D Belaria® SRM	mm	890/480/344		
• Indoor unit H/W/D Belaria® compact SRM	mm	1732/600/728		
Weights				
• Net weight of outdoor unit	kg	54	56	56
• Net weight of indoor unit				
Belaria® SRM	kg	44	48	48
Belaria® compact SRM	kg	115	126	126
• Gross weight of outdoor unit	kg	57	59	59
• Gross weight of indoor unit				
Belaria® SRM	kg	47	51	51
Belaria® compact SRM	kg	128	140	140
• Compressor		hermetically sealed, variable speed compressor		
• Refrigerant filling R 410A	kg	1.5	1.6	1.6
• Fan		axial, variable speed		
• Evaporator		fins coated aluminium, tubes copper		
• Condenser type		Copper-soldered stainless steel plate heat exchanger		
• Condenser water content	litres	0.9	1.3	1.3
• Pipe connection flow/return	R	11/4″	11/4″	11/4″
• Max. volume flow	m^3/h	1.5	2.0	2.0
• Min. volume flow	m^3/h	0.7	0.7	0.7
• Max. operat. press. on the heating side	bar	3.0	3.0	3.0
• Expansion tank volume	litres	10	10	10
• Total water content Belaria® SRM	litres	3	5	5
• Total water content Belaria® compact SRM	litres	4.4	5.8	5.8
• Calorifier / Belaria® compact SRM	litres	180	260	260
• Max. hot water temperature [3]	°C	65	65	65
• Operating pressure/test pressure	bar	8/13	8/13	8/13
• Calorifier material		Stainless steel (EN 1.4521)		
• Thermal insulation material		EPS		
• Standby losses (EN 12897)	kWh/24 h	1.4	1.9	1.9
Connection, refrigerant line				
• Dimension of liquid line	Inches/mm	1/4 / 6.4	1/4 / 6.4	1/4 / 6.4
• Dimension of gas pipe	Inches/mm	5/8 / 15.9	5/8 / 15.9	5/8 / 15.9
• Max. length of refrigerant line	m	30	30	30
• Min. length of refrigerant line	m	3	3	3
• Max. height differ. outside/indoor unit		20	20	20

- See diagrams for areas of application for heating, hot water and cooling.

Type		SRM (4)	SRM (6)	SRM (8)
Electrical data				
• Max. power consumption during heating operation				
• Heat pump	kW	2.4	2.6	3.3
• Emergency heating	kW	3	2 stage 3/9	2 stage 3/9
Voltage				
• Compressor	V	230	230	230
• Fan	V	230	230	230
• Emergency heating	V	230	3 kW and 9 kW	3 x 400 volts
• Frequency	Hz	50	50	50
• Voltage range		+/- 10 %	+/- 10 %	+/- 10 %
Operating current max.				
• Compressor	A	15	15	15
• Starting current	A	11	11	11
• Fuse	A	16T	16T	16T

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

[1] Cooling capacity and EER at nominal load (EN 14511)

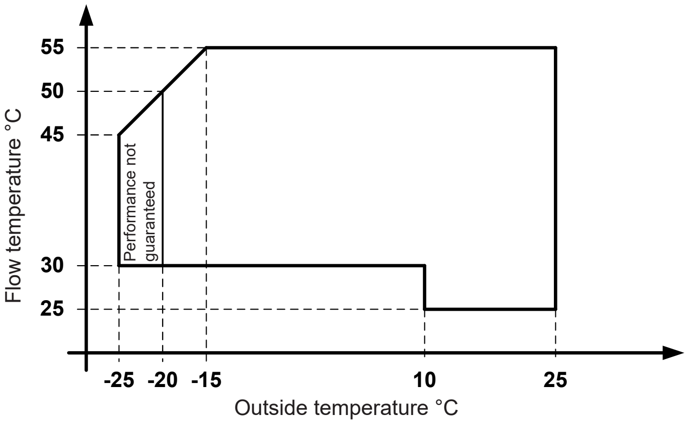
[2] Heat output and COP at nominal load (EN 14511)

[3] with electric supplemental heating

Diagrams of areas of application

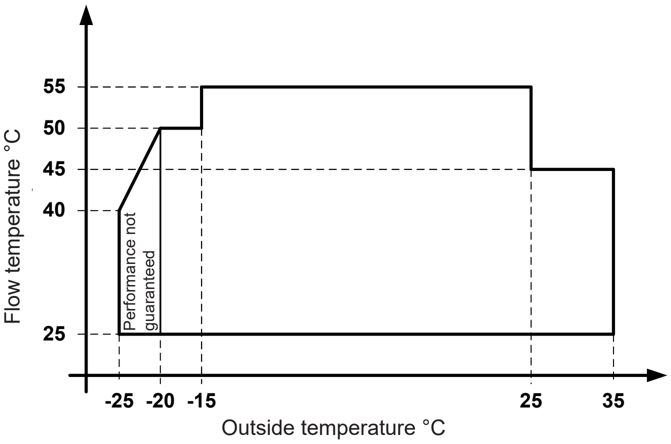
Heating

Belaria® SRM (4-8)
Belaria® compact SRM (4-8)

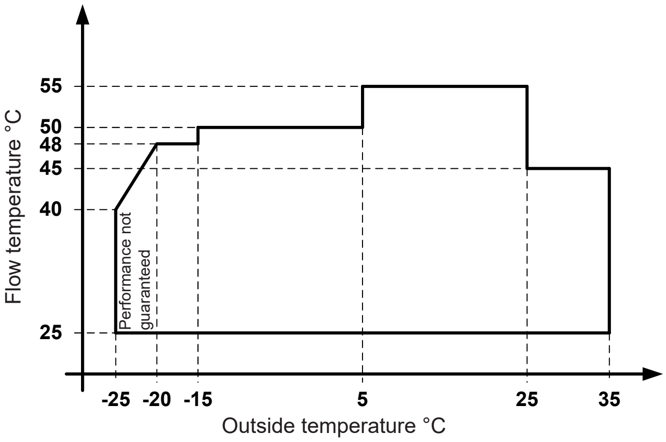


Hot water

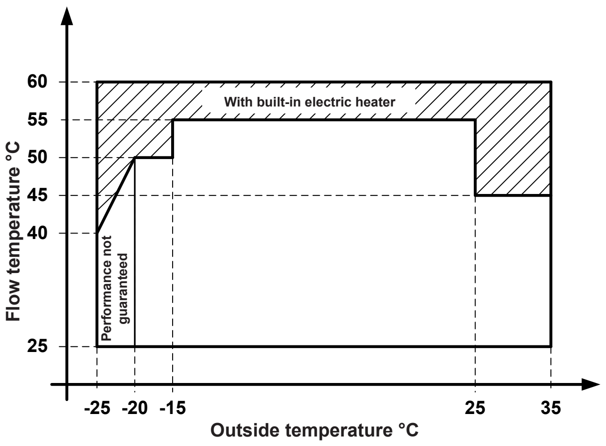
Belaria® SRM (4)



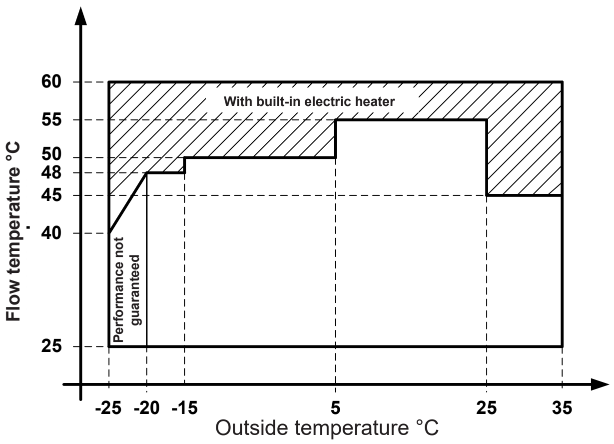
Belaria® SRM (6-8)



Belaria® compact SRM (4)

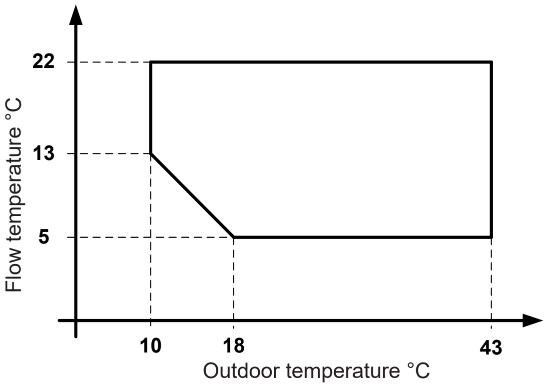


Belaria® compact SRM (6-8)



Cooling

Belaria® SRM (4-8)
Belaria® compact SRM (4-8)



Belaria® SRM
Belaria® compact SRM

- **Sound pressure level - sound power level**[3]
  The sound pressure levels indicated below apply if the outdoor unit is placed at a building facade. 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.
  The **sound pressure level** is dependent on the **place of measurement** 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.

Structure-borne sound
The indoor unit must be attached to the wall with a sound insulation dowel with collar. The bases and consoles for the outdoor unit must be erected/installed with vibration-damping against the structural shell.

Belaria® SRM		(4)	(6)	(8)
Outdoor unit				
• Sound power level in heating operation [2, 3]	dB(A)	57	58	58
• Sound pressure level in heating operation at 5 m [1, 2, 3]	dB(A)	38	39	39
• Sound pressure level in heating operation at 10 m [1, 2, 3]	dB(A)	32	33	33
Indoor unit				
• Sound pressure level at 1 m	dB(A)	28	28	28

[1] The sound pressure levels indicated apply if the outdoor unit is placed at a building facade. 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.

[2] The sound levels apply in whisper mode. The values are increased at full load by + 4 dB(A) for Belaria® SRM (4-8).

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

Pressure expansion tank

The indoor unit is equipped with an expansion tank (flat shape) with a volume of 10 l, pre-pressure 1 bar

				Factory setting				
Pre-pressure [1]	bar	0.5	0.8	1.0	1.2	1.5	1.8	2.1
Capacity	l	5.5	4.5	4.0	3.5	2.5	2.0	0.7
Maximum possible system height Hp [2]	m	2	5	7	9	12	15	18

[1] Pre-pressure = system height + 0.3 bar. The pre-pressure should be adjusted to the system height.

[2] System pressure Hp = hydrostatic pressure of the system, i.e. height from the centre of the tank to the highest air-bleeding point of the system.

$$V_n = V_A \times f \times X \text{ (litres)}$$

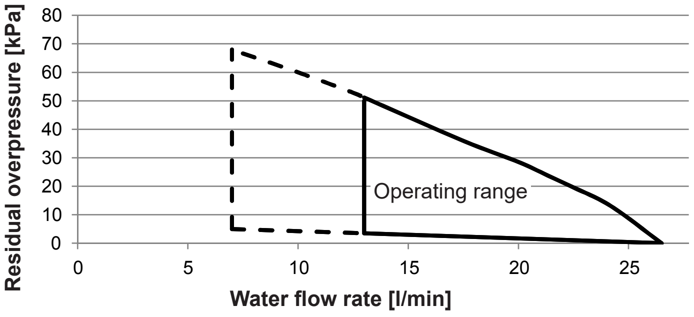
V_n = expansion volume (litres)
V_A = system content at + 10 °C
f = thermal expansion factor (45°), f = 0.01
X = add-on factor, X = 3

	System	V_A	V_n
System content (underfloor heating system)	5 kW	120 l	3.6 l expansion quantity
	6 kW	140 l	4.2 l expansion quantity
	7 kW	160 l	4.8 l expansion quantity
	8 kW	180 l	5.4 l expansion quantity
	9 kW	200 l	6.0 l expansion quantity

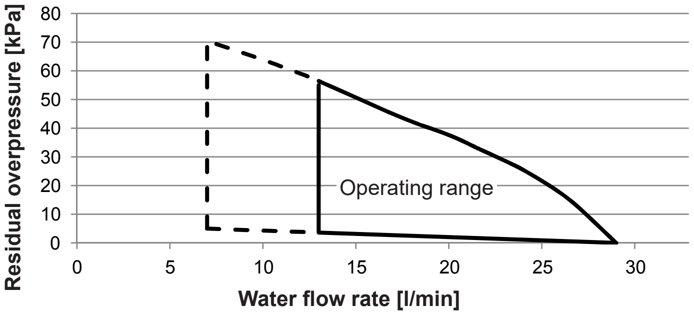
If the capacity of the installed expansion tank is not sufficient, an additional tank must be installed outside the unit.

Pump characteristic curves Belaria® SRM (4-8)

Belaria® SRM (4)

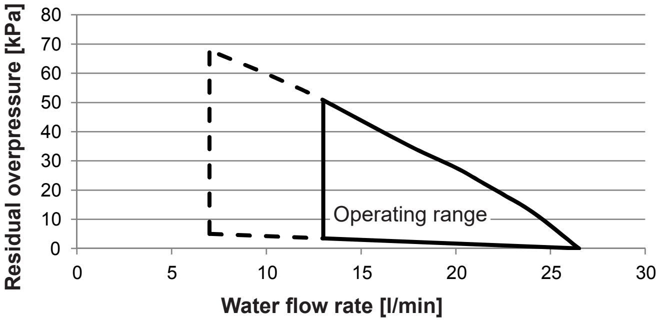


Belaria® SRM (6,8)

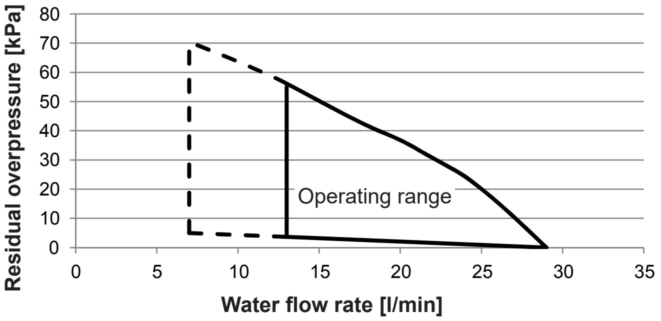


Pump characteristic curves Belaria® compact SRM (4-8)

Belaria® compact SRM (4)



Belaria® compact SRM (6,8)

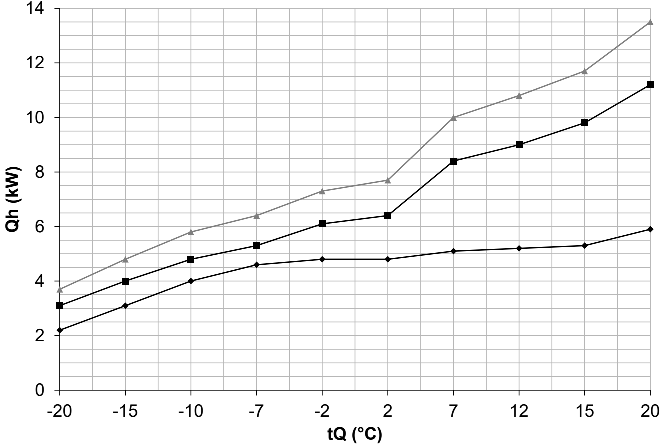


Performance data - heating

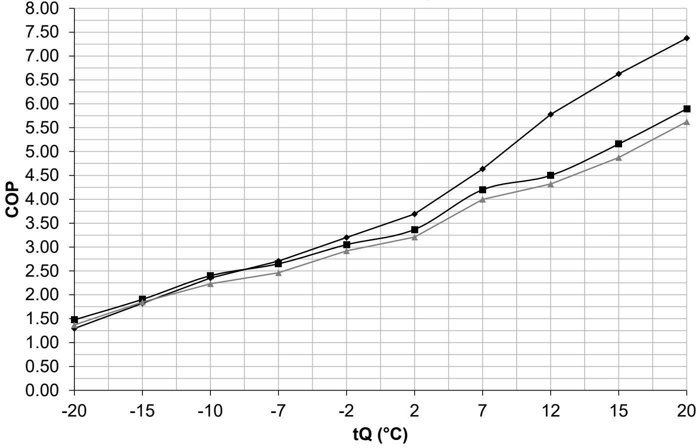
Maximum heat output allowing for defrosting losses

Belaria® SRM (4-8), Belaria® compact SRM (4-8)

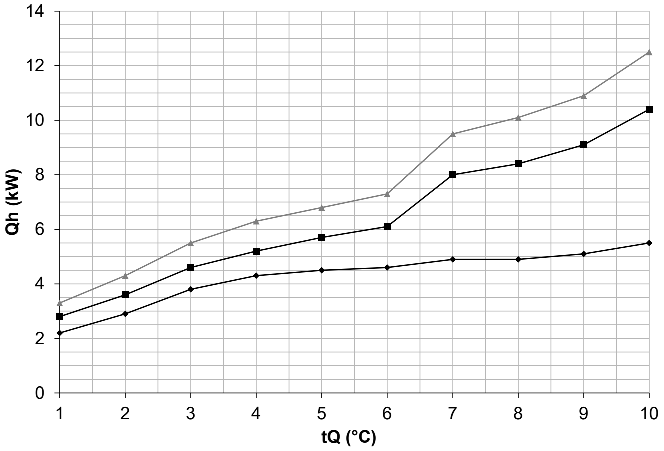
Heat output - t_{VL} 35 °C



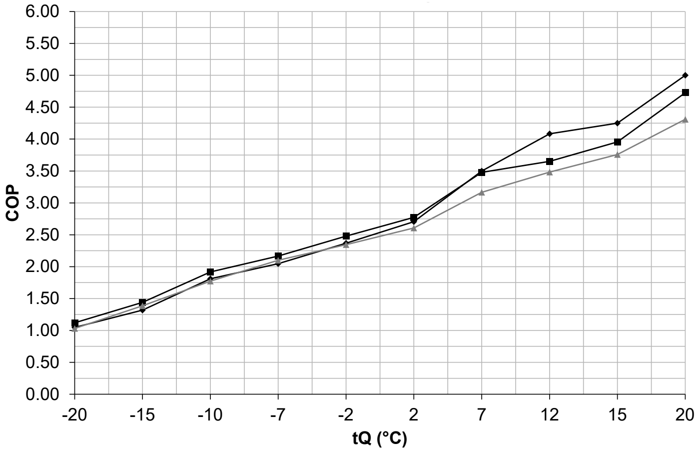
Output rating - t_{VL} 35 °C



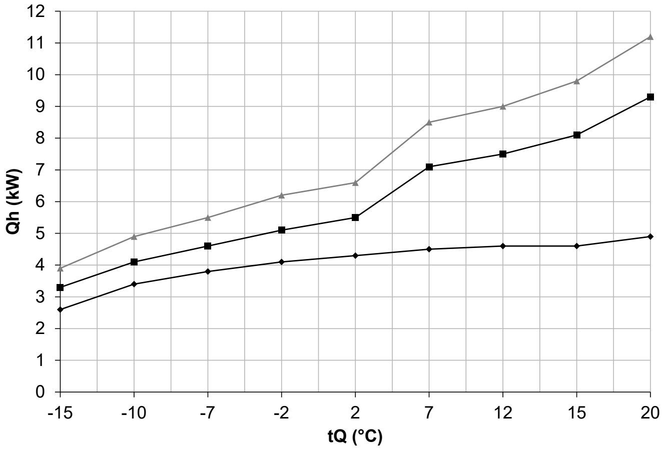
Heat output - t_{VL} 45 °C



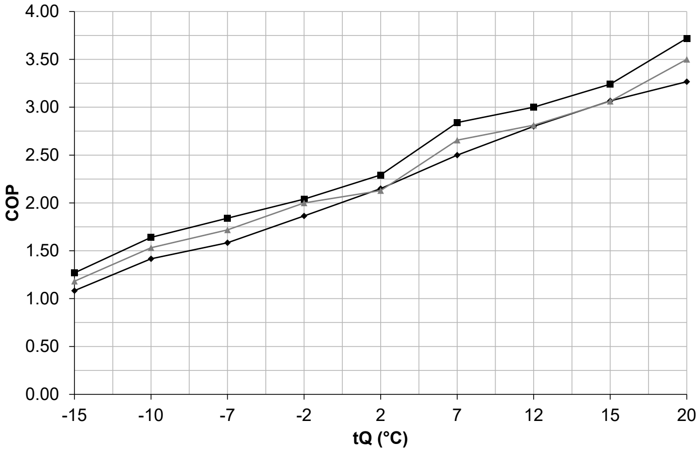
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Output rating - t_{VL} 55 °C



tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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® SRM (4)
■ Belaria® SRM (6)
▲ Belaria® SRM (8)

Performance data - heating

Belaria® SRM (4-8), Belaria® compact SRM (4-8)

Indications acc. to EN14511

Type			(4)			(6)			(8)	
tVL °C	**tQ °C**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**
30	-20	2.3	1.5	1.48	3.2	1.9	1.67	3.8	2.4	1.57
	-15	3.3	1.5	2.16	4.1	1.9	2.22	5.0	2.4	2.08
	-10	4.2	1.5	2.73	5.0	1.8	2.72	6.0	2.3	2.55
	-7	4.7	1.5	3.07	5.5	1.8	3.03	6.6	2.3	2.84
	-2	4.8	1.4	3.56	6.2	1.8	3.44	7.4	2.3	3.24
	2	4.9	1.2	4.12	6.6	1.8	3.74	7.9	2.3	3.51
	7	5.3	1.0	5.30	8.5	1.8	4.61	10.2	2.4	4.33
	12	5.3	0.8	6.87	9.2	1.8	5.05	11.0	2.3	4.76
	15	5.5	0.8	7.20	10.0	1.8	5.60	12.0	2.3	5.28
	20	6.0	0.7	8.14	11.5	1.8	6.54	13.8	2.3	6.14
35	-20	2.2	1.7	1.29	3.1	2.1	1.47	3.7	2.7	1.38
	-15	3.1	1.7	1.80	4.0	2.1	1.94	4.8	2.6	1.82
	-10	4.0	1.7	2.36	4.8	2.0	2.37	5.8	2.6	2.23
	-7	4.6	1.7	2.81	5.3	2.0	2.64	6.4	2.6	2.48
	-2	4.8	1.5	3.13	6.1	2.0	3.10	7.3	2.5	2.92
	2	4.8	1.3	3.59	6.4	1.9	3.37	7.7	2.4	3.17
	7	5.1	1.1	4.57	8.4	2.0	4.20	10.0	2.5	3.94
	12	5.2	0.9	6.05	9.0	2.0	4.60	10.8	2.5	4.32
	15	5.3	0.8	6.53	9.8	1.9	5.12	11.7	2.4	4.80
	20	5.9	0.8	7.22	11.2	1.9	5.99	13.5	2.4	5.66
40	-20	2.2	1.9	1.15	2.9	2.4	1.24	3.5	3.0	1.16
	-15	3.2	1.9	1.67	3.8	2.3	1.64	4.5	2.9	1.54
	-10	4.0	1.9	2.12	4.7	2.3	2.10	5.7	2.9	1.98
	-7	4.5	1.9	2.40	5.3	2.2	2.38	6.4	2.8	2.24
	-2	4.6	1.7	2.71	6.0	2.1	2.82	7.3	2.7	2.66
	2	4.7	1.5	3.05	6.2	2.1	3.00	7.4	2.6	2.83
	7	5.0	1.3	3.82	8.2	2.2	3.80	9.8	2.7	3.58
	12	5.1	1.0	5.00	8.7	2.1	4.14	10.5	2.7	3.88
	15	5.2	1.0	5.27	9.5	2.1	4.55	11.4	2.7	4.27
	20	5.7	1.0	5.97	10.9	2.1	5.29	13.0	2.6	4.97
45	-20	2.2	2.1	1.01	2.8	2.5	1.10	3.3	3.2	1.03
	-15	2.9	2.2	1.36	3.6	2.5	1.47	4.3	3.1	1.39
	-10	3.8	2.1	1.81	4.6	2.4	1.91	5.5	3.1	1.80
	-7	4.3	2.1	2.10	5.2	2.4	2.19	6.3	3.0	2.06
	-2	4.5	1.9	2.41	5.7	2.3	2.50	6.8	2.9	2.34
	2	4.6	1.7	2.71	6.1	2.2	2.77	7.3	2.8	2.61
	7	4.9	1.4	3.40	8.0	2.3	3.43	9.5	3.0	3.22
	12	4.9	1.2	4.06	8.4	2.3	3.66	10.1	2.9	3.44
	15	5.1	1.2	4.22	9.1	2.3	4.03	10.9	2.9	3.78
	20	5.5	1.1	4.88	10.4	2.2	4.66	12.5	2.9	4.39
50	-20	2.1	2.3	0.89	2.7	2.6	1.05	3.3	3.2	1.02
	-15	2.9	2.3	1.22	3.5	2.5	1.40	4.2	3.2	1.32
	-10	3.6	2.3	1.57	4.5	2.5	1.80	5.3	3.2	1.69
	-7	4.1	2.3	1.78	5.0	2.5	2.04	6.0	3.1	1.91
	-2	4.3	2.1	2.03	5.6	2.4	2.35	6.7	3.0	2.22
	2	4.4	1.9	2.29	6.0	2.3	2.61	7.2	2.9	2.45
	7	4.7	1.7	2.83	7.5	2.4	3.14	9.0	3.1	2.94
	12	4.7	1.5	3.22	8.0	2.4	3.35	9.6	3.1	3.15
	15	4.8	1.4	3.47	8.7	2.4	3.65	10.4	3.0	3.43
	20	5.2	1.3	3.92	9.9	2.4	4.19	11.9	3.0	3.94
55	-15	2.6	2.4	1.08	3.3	2.6	1.28	3.9	3.3	1.20
	-10	3.4	2.4	1.39	4.1	2.5	1.61	4.9	3.2	1.52
	-7	3.8	2.4	1.58	4.6	2.5	1.82	5.5	3.2	1.71
	-2	4.1	2.2	1.85	5.1	2.5	2.09	6.2	3.1	1.96
	2	4.3	2.0	2.11	5.5	2.4	2.29	6.6	3.1	2.15
	7	4.5	1.8	2.58	7.1	2.5	2.85	8.5	3.2	2.69
	12	4.6	1.5	3.01	7.5	2.5	3.04	9.0	3.2	2.87
	15	4.6	1.5	3.13	8.1	2.5	3.30	9.8	3.2	3.10
	20	4.9	1.5	3.37	9.3	2.5	3.77	11.2	3.2	3.55

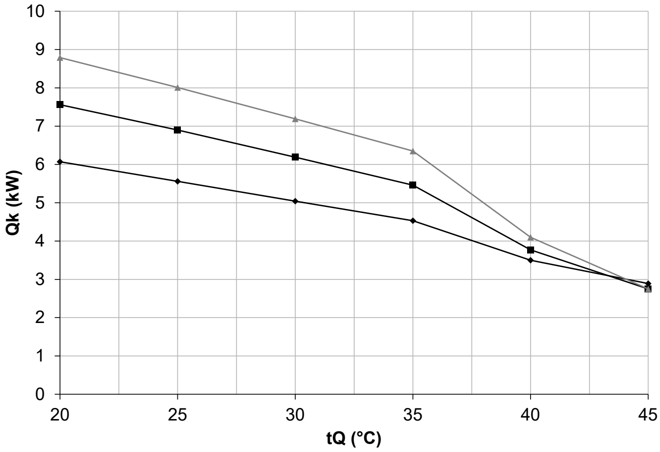
tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = heat output at full load (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW)
incl. high-efficiency pump, measured in accordance with EN 14511
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

Performance data - cooling

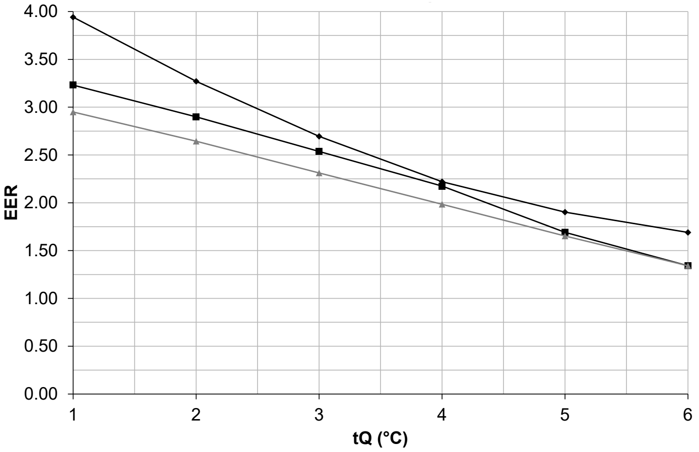
Maximum cooling capacity

Belaria® SRM (4-8), Belaria® compact SRM (4-8)

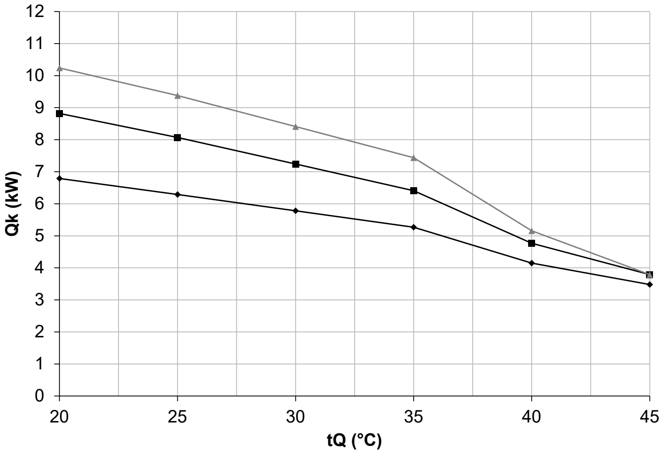
Cooling capacity - t_{VL} 7 °C



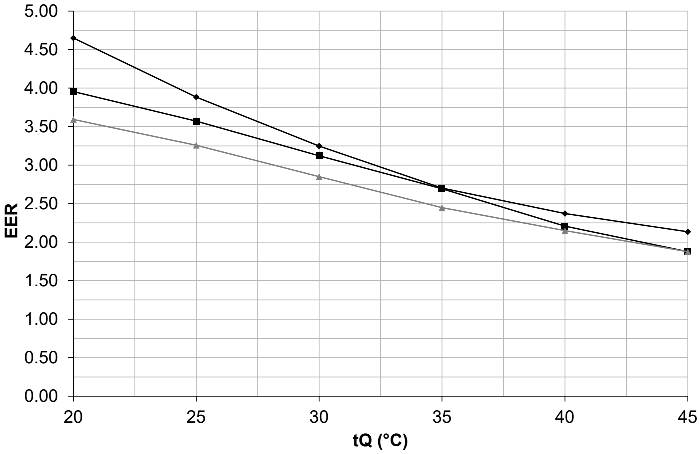
Output rating - t_{VL} 7 °C



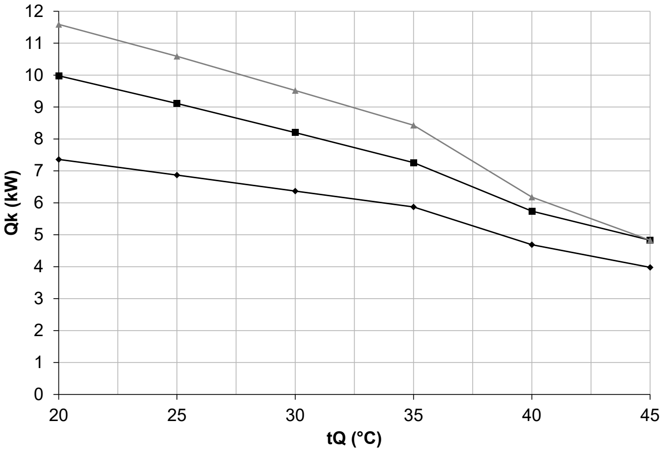
Cooling capacity - t_{VL} 13 °C



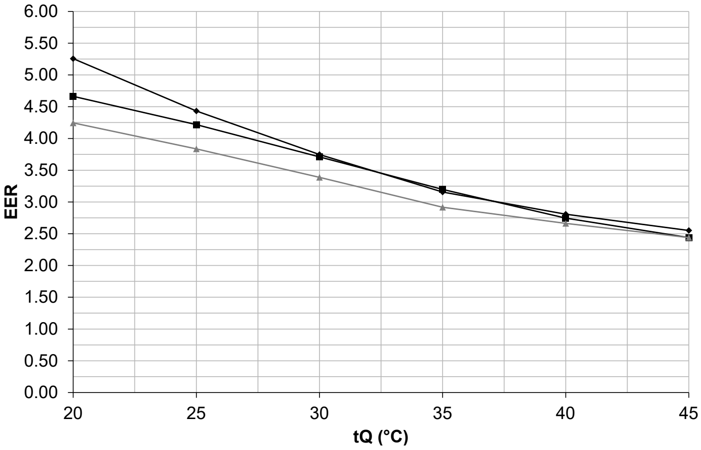
Output rating - t_{VL} 13 °C



Cooling capacity - t_{VL} 18 °C



Output rating - t_{VL} 18 °C



tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
EER = Energy Efficiency Rate for the overall unit in accordance with standard EN 14511

—◆— Belaria® SRM (4)
—■— Belaria® SRM (6)
—▲— Belaria® SRM (8)

Performance data - cooling

Belaria® SRM (4-8), Belaria® compact SRM (4-8)

Indications acc. to EN14511

Type tVL °C	tQ °C	Qk kW	(4) P kW	EER	Qk kW	(6) P kW	EER	Qk kW	(8) P kW	EER
7	20	6.1	1.5	3.94	7.6	2.3	3.23	8.8	3.0	2.95
	25	5.6	1.7	3.27	6.9	2.4	2.90	8.0	3.0	2.64
	30	5.0	1.9	2.70	6.2	2.4	2.54	7.2	3.1	2.31
	35	4.5	2.0	2.22	5.5	2.5	2.18	6.4	3.2	1.98
	40	3.5	1.8	1.90	3.8	2.2	1.69	4.1	2.5	1.65
	45	2.9	1.7	1.69	2.8	2.1	1.34	2.8	2.1	1.34
10	20	6.5	1.5	4.30	8.2	2.3	3.57	9.5	2.9	3.26
	25	5.9	1.7	3.58	7.5	2.3	3.22	8.7	3.0	2.93
	30	5.4	1.8	2.96	6.7	2.4	2.82	7.8	3.0	2.57
	35	4.9	2.0	2.46	5.9	2.5	2.42	6.9	3.1	2.21
	40	3.8	1.8	2.13	4.3	2.2	1.94	4.6	2.4	1.89
	45	3.2	1.7	1.90	3.2	2.0	1.59	3.2	2.0	1.59
13	20	6.8	1.5	4.65	8.8	2.2	3.96	10.2	2.9	3.59
	25	6.3	1.6	3.88	8.1	2.3	3.57	9.4	2.9	3.26
	30	5.8	1.8	3.25	7.2	2.3	3.12	8.4	3.0	2.85
	35	5.3	2.0	2.70	6.4	2.4	2.69	7.4	3.0	2.45
	40	4.2	1.8	2.37	4.8	2.2	2.21	5.2	2.4	2.15
	45	3.5	1.6	2.13	3.8	2.0	1.88	3.8	2.0	1.88
15	20	7.0	1.4	4.87	9.3	2.2	4.20	10.8	2.8	3.84
	25	6.5	1.6	4.10	8.5	2.2	3.82	9.9	2.8	3.48
	30	6.0	1.8	3.43	7.6	2.3	3.35	8.8	2.9	3.05
	35	5.5	1.9	2.88	6.7	2.3	2.88	7.8	3.0	2.63
	40	4.4	1.7	2.53	5.1	2.1	2.41	5.6	2.4	2.34
	45	3.7	1.6	2.29	4.2	2.0	2.09	4.2	2.0	2.09
18	20	7.4	1.4	5.26	10.0	2.1	4.66	11.6	2.7	4.25
	25	6.9	1.6	4.43	9.1	2.2	4.22	10.6	2.8	3.84
	30	6.4	1.7	3.75	8.2	2.2	3.71	9.5	2.8	3.39
	35	5.9	1.9	3.16	7.3	2.3	3.20	8.4	2.9	2.92
	40	4.7	1.7	2.81	5.7	2.1	2.75	6.2	2.3	2.66
	45	4.0	1.6	2.55	4.8	2.0	2.44	4.8	2.0	2.44
22	20	8.0	1.3	5.96	11.0	2.1	5.32	12.8	2.6	4.85
	25	7.5	1.5	5.05	10.1	2.1	4.87	11.8	2.7	4.44
	30	7.0	1.6	4.26	9.1	2.1	4.27	10.5	2.7	3.90
	35	6.5	1.8	3.65	8.0	2.2	3.70	9.3	2.8	3.36
	40	5.2	1.6	3.27	6.7	2.0	3.28	7.1	2.3	3.16
	45	4.5	1.5	3.00	5.8	2.0	2.99	5.8	2.0	2.99

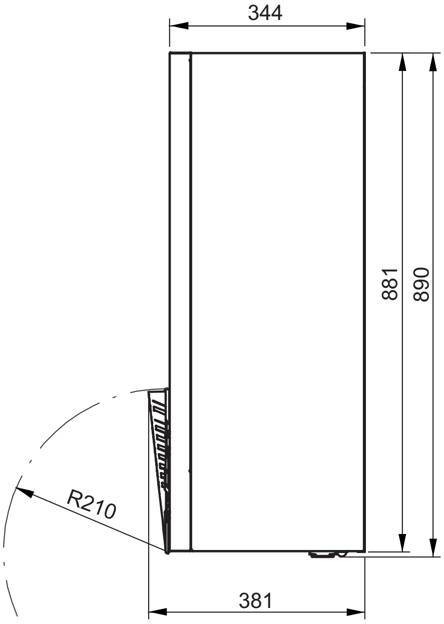
tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
EER = Energy Efficiency Rate for the overall unit in accordance with standard EN 14511

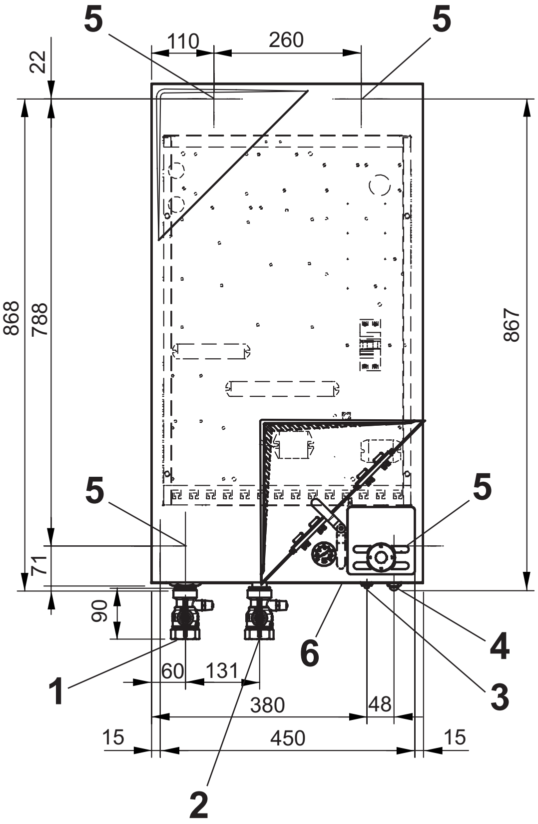
Observe daily power interruptions!
see “Engineering heat pumps general”

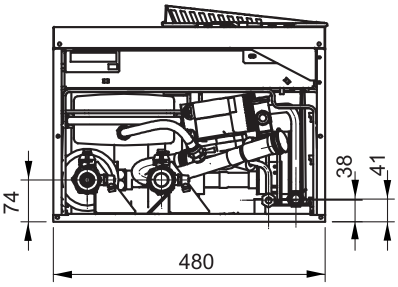
Belaria® SRM (4-8)
Indoor unit

(dimensions in mm)

1 Heating flow Rp 1¼″
2 Heating return Rp 1¼″
3 Liquid line ¼″ (6.35 mm)
4 Hot gas line ⅝″ (15.9 mm)
5 Mounting holes
6 Drain safety valve Rp ½″

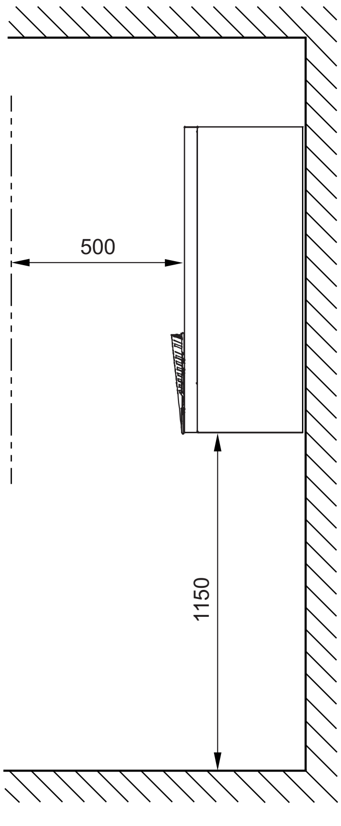


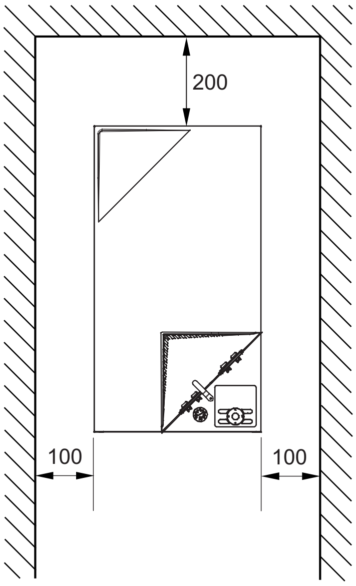




Space requirement for maintenance work and ventilation
Indoor unit

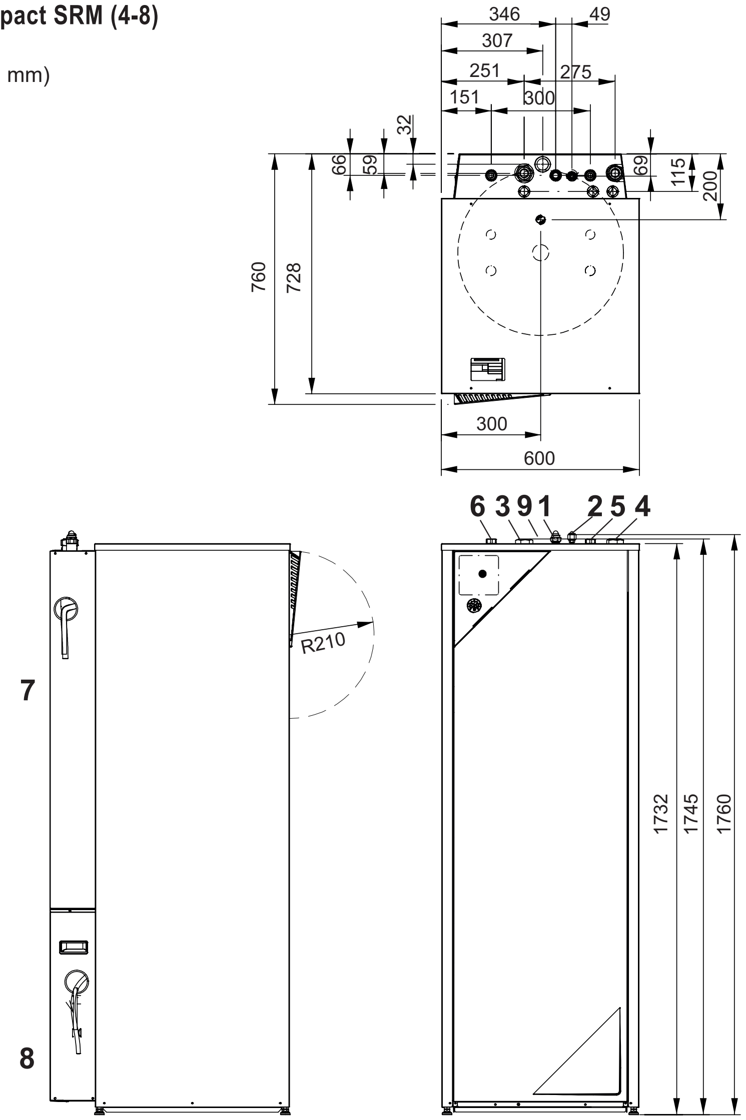
(Dimensions in mm)





Belaria® compact SRM (4-8) indoor unit

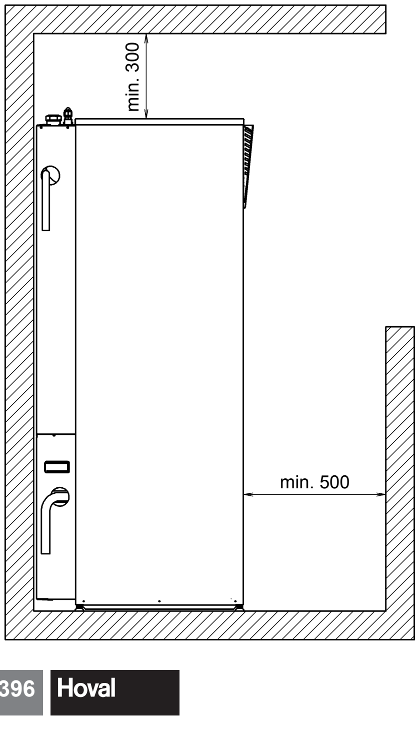
(Dimensions in mm)



1 Hot gas line ⅝″ (15.9 mm)
2 Liquid line
Belaria® SRM (4-8) ¼″ (6.35 mm)
Belaria® SRM (11-16) ⅜″ (9.5 mm)
3 Heating flow R 1¼″
4 Heating return R 1¼″
5 Cold water connection R 1″
6 Hot water connection R 1″
Union nut
7 Drain safety valve
8 Condensate drain (cooling)
9 Cable entry point

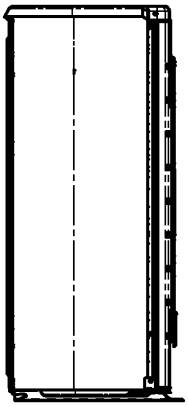
Space requirement for maintenance work and ventilation Indoor unit

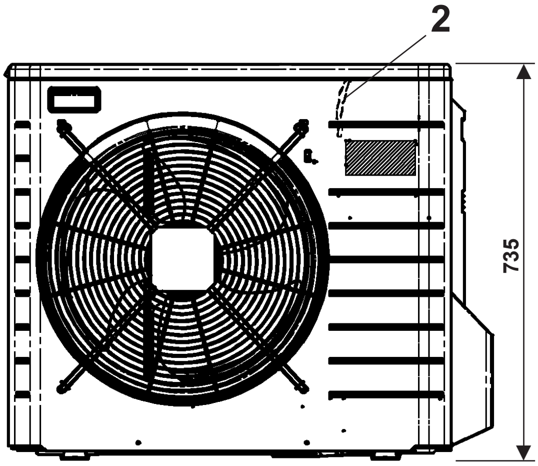
(Dimensions in mm)

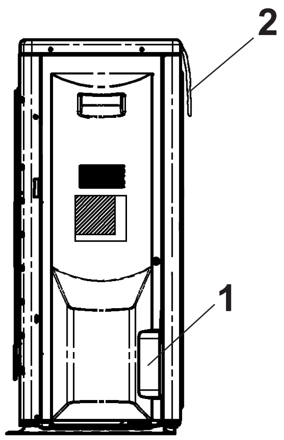


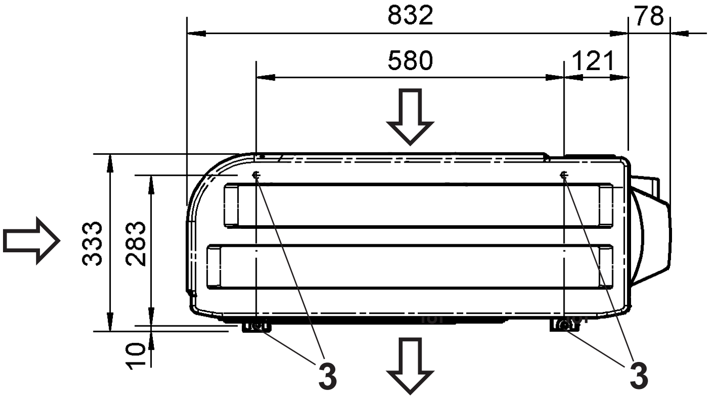
Belaria® SRM (4-8), Hoval Belaria® compact SRM (4-8)
Outdoor unit

(Dimensions in mm)







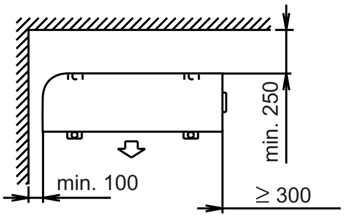


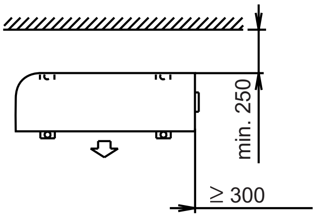
1 Connections for refrigerant connecting lines
2 Outdoor temperature sensor
3 Hole for fastening bolts M8 or M10

Space requirement

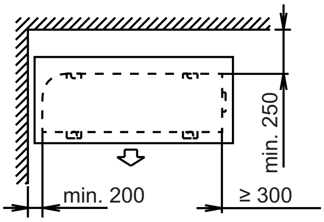
(Dimensions in mm)

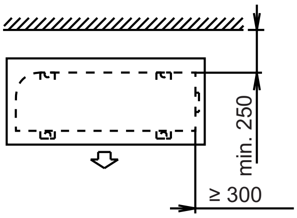
Belaria® SRM, Belaria® compact SRM outdoor unit without roof



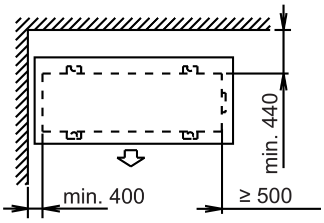


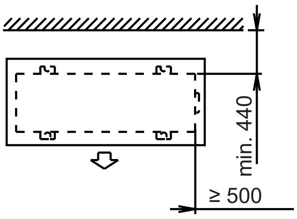
Belaria® SRM, Belaria® compact SRM outdoor unit with roof



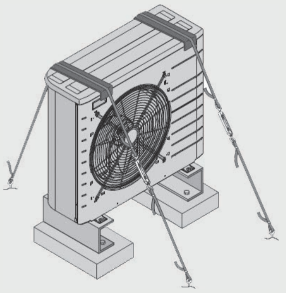


Belaria® SRM, Belaria® compact SRM outdoor unit with acoustic insulation housing





- There must be adequate space for the outlet (approx. 1 m) to route off the cooled air.
- The outdoor unit must be protected against heavy snowfall. If necessary, provide cover (e.g. roof, see Accessories).
- Observe the maximum permissible roof load without fail! (weight of unit, concrete base and any snow load).
- The outdoor unit must be placed on feet at least 250 mm / 50 mm high. There must be a gravel bed under it to discharge the condensation. (see base plans)
- The external unit must be secured against blowing over in windy areas.



Dimensions of protective roof for outdoor unit

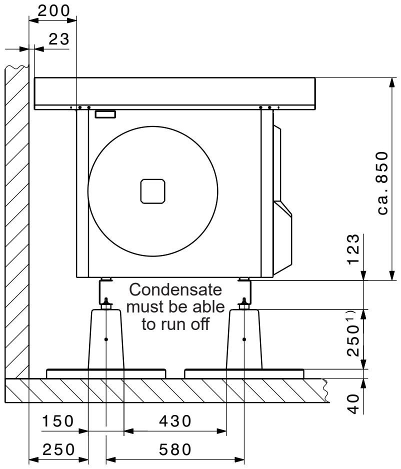
Belaria® SRM type	W	D
(4-8)	1102	577

Base plans for Belaria® SRM (4-8), Belaria® compact SRM (4-8)

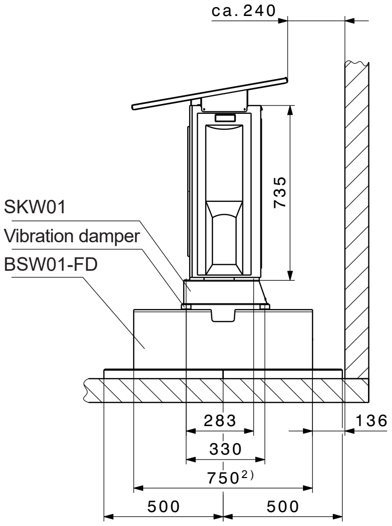
(Dimensions in mm)

Concrete base - firm base

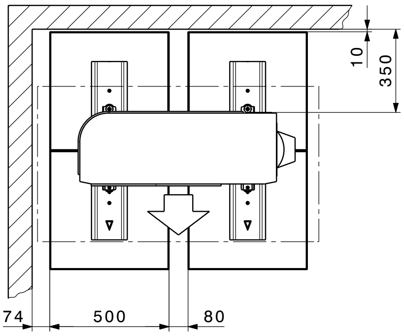
Front view



Side view



View from above



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1) Depending on the possible snow depth; for version with sound attenuation housing >50-70 base height 200 mm (included in the scope of delivery)

2) Design with sound attenuation housing min. length 950

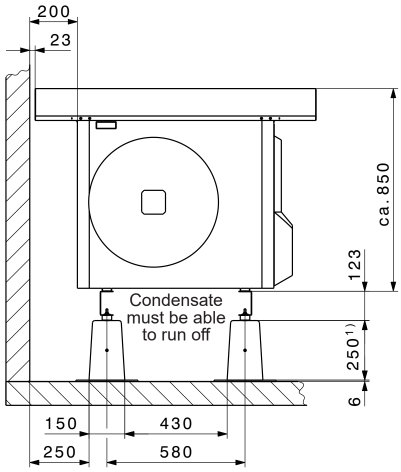
- Prevention of the transmission of structure-borne sound to the roof is very important. Specialists may need to be consulted, depending on the specific roof design.
- The outdoor unit must not be installed directly above bedrooms!
- The outdoor unit must be attached to the base using 4 vibration dampers M8 and concrete dowels (see Accessories).
- The outdoor unit must be protected against heavy snowfall. If necessary, provide a cover.
- Observe the maximum permissible roof load without fail! (weight of unit, concrete base and any snow load).

Base plans for Belaria® SRM (4-8), Belaria® compact SRM (4-8)

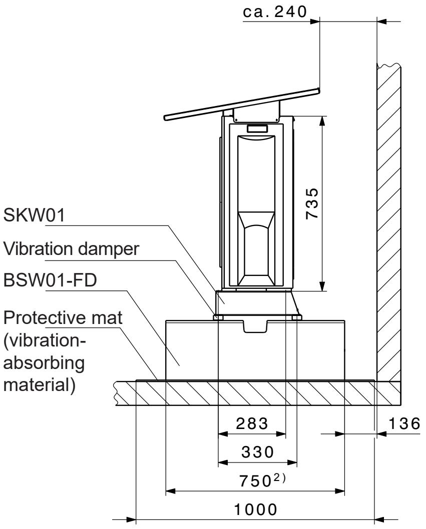
(Dimensions in mm)

Concrete base - flat roof

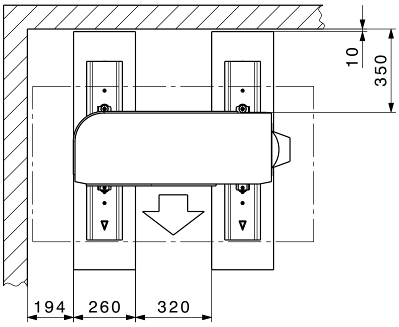
Front view



Side view



View from above

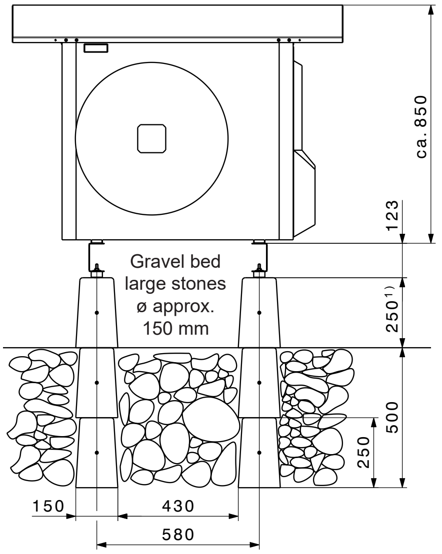


1) Depending on the possible snow depth; for version with sound attenuation housing >50-70 base height 200 mm (included in the scope of delivery)

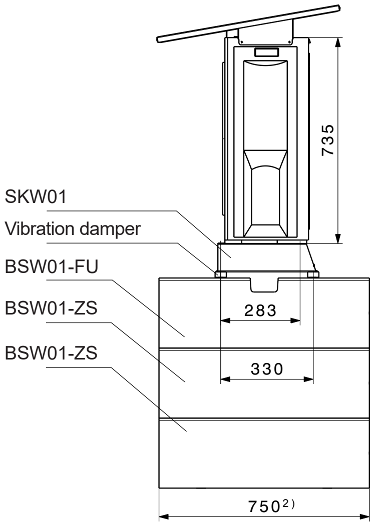
2) Design with sound attenuation housing min. length 950

Concrete base - gravel bed

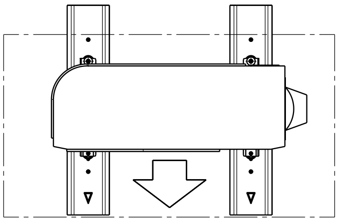
Front view



Side view



View from above



1) Depending on the possible snow depth; for version with sound attenuation housing >50-70 base height 200 mm (included in the scope of delivery)

2) Design with sound attenuation housing min. length 950

Requirements and directives

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

Set-up

General comments

- The distance between the inside and outdoor unit must be as short as possible. Only short and simple routing of refrigerant connecting lines guarantees cost effectiveness.
- The required minimum length for the lines between the outside and indoor unit is 3 m, and the lines must not be shorter than this. The maximum permissible length of the lines between the outdoor and indoor unit is 30 m (4-8) and 50 m (11-16) and must not be exceeded. The maximum permissible height difference between outside and indoor unit is 20/30 m. The maximum permissible length of the lines between calorifier and indoor unit is 10 m. The cable of the tank sensor must not be shortened. It is essential to clarify details of the installation location and line routing with Hoval!

Indoor unit

- The indoor unit of the Hoval Belaria® SRM air/water heat pump system can be mounted on the wall in the boiler room using a sound insulation dowel with collar.
- The installation location must be selected in accordance with the valid requirements and directives.
- The installation must be free from dust or other foreign matter which could lead to contamination.
- Where possible, the installation location should be outside noise-sensitive areas of the building and equipped with a sound-absorbing door.
- The heating supply and return should be connected flexibly in structures which are sensitive with regard to noise emissions (see accessories).
- Access for the purpose of operation and maintenance must be ensured.
- Rooms with high air humidity, for example laundry rooms, are not suitable installation locations (dewpoint <10 °C).

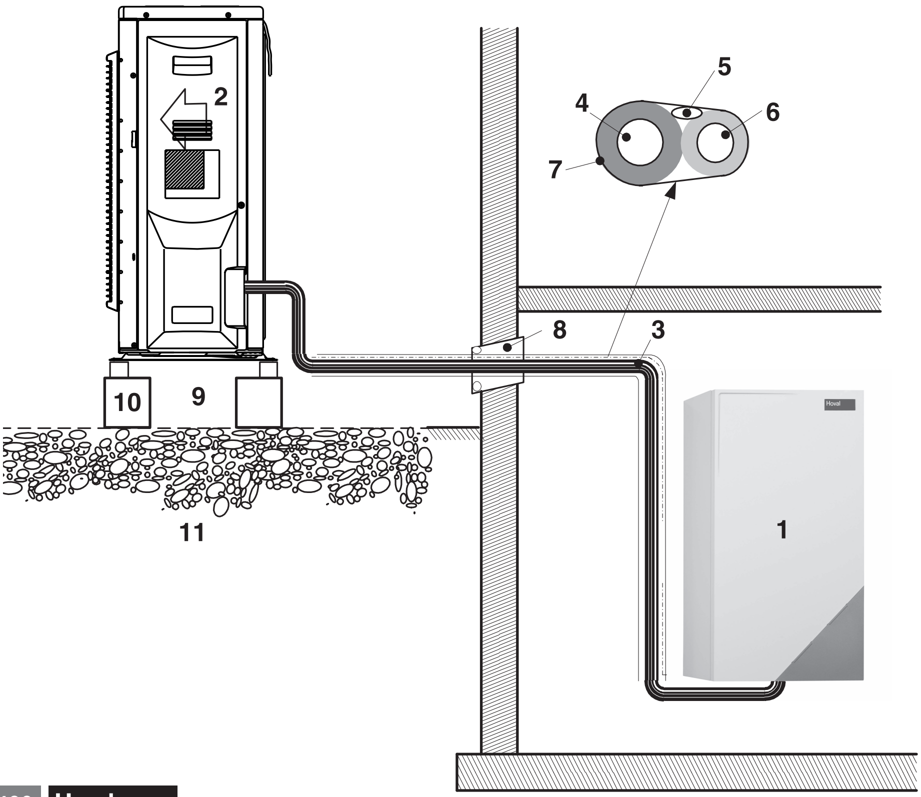
It is imperative that a system water protection filter is installed in the heating return upstream from the heat pump.

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:

- The subsoil in the installation location must be sufficiently stable to bear the weight of the unit and its vibration in operation.
- The location should 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 which is sensitive to moisture under the unit.
- 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 plants at risk of frost damage are allowed to be on the blow-out side.
- Installation on a wall console is not suitable in the case of lightweight walls. Lightweight walls can increase sound emissions and transmit structure-borne sound.
- It is essential to avoid air short-circuiting. The space necessary for intake and outlet must always be provided (see space requirements).
- 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).
- The units cannot be installed 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 from 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.
- Fit a deflector plate on the air outlet side of the outdoor unit to prevent exposure to the wind.
- In areas with heavy snowfall, select an installation location where snow cannot impair the operation of the unit (cover).
- Install the unit at sufficient height from the ground to ensure that the unit is not covered by snow and freezing condensate cannot impair operation (see separate base plans).

Cross-section of connecting line



1 Indoor unit
2 Outdoor unit (evaporator/fan/compressor)
3 Refrigerant connecting line
4 Hot gas line with thermal insulation
5 1 x communication line 4-pole,
 1 x electrical power supply outdoor unit 3-pole,
 1 x connection line condensate drip tray heater 2-pole (optional),
 1 x electrical power supply condensate drip tray heater 3-pole (optional) if separate protection necessary
6 Liquid line with thermal insulation
7 Wrapping or duct (on site)
8 PE casing tube Ø at least 100 mm with sealing (on site). All casing tubes for the lines must be routed straight (it must be possible to look down the tube and see the other end!).
9 Condensate
10 Base or paving slab to be provided on site (The height is to be determined depending on the climate zone, recommended height >250 mm)
11 Drainage (on site)

Line length between outdoor unit and indoor unit

Belaria® SRM type	(4-8)
• Minimum line length	3 m
• Maximum permissible length	30 m
• Maximum permissible height difference	20 m

Condensate (outdoor unit)

- Condensate must be able to run off freely.
- Use a condensate drip tray if the condensate has to be drained off collectively (option).
- It is essential to insulate the condensate hose from the tray, and if necessary, equip the hose with trace heating.

Refrigerant connecting lines

- The refrigerant connecting lines must be installed by qualified technicians.
- The line dimensions must be precisely adhered to (see also Section “Part No.”; refrigerant connecting lines).
- The indoor and outdoor unit, with the hot gas and liquid line, must be fitted professionally with thermal insulation.

Wall lead-through, protective pipe for routing of the lines

The wall lead-through and the protective pipe (Ø min. 100 mm) for the connecting lines must be routed with no changes of direction, executed professionally and sealed.
The lines must not be concreted in, as the vibrations can generate structure-borne sound.
In the external area, the protective pipes must be manufactured from UV-resistant material.

Room cooling

- Room cooling can be effected with 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.
- Optimum comfort can be achieved with an additional Hoval HomeVent comfort ventilation unit with the CoolVent option.
- 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.

Electric connecting cables

- The electric connecting cables on the outdoor unit must be connected flexibly.
- Taking advantage of the special reduced tariffs offered by local energy companies for heat pump systems often means interrupted operation. For example, within any 24-hour period, the power supply may be interrupted for 3 periods of 2 hours each. This must be taken into account when dimensioning and planning the heat pump.
- The trace heating tape must be connected externally in accordance with applicable regulations and protected by a ground fault circuit interrupter.

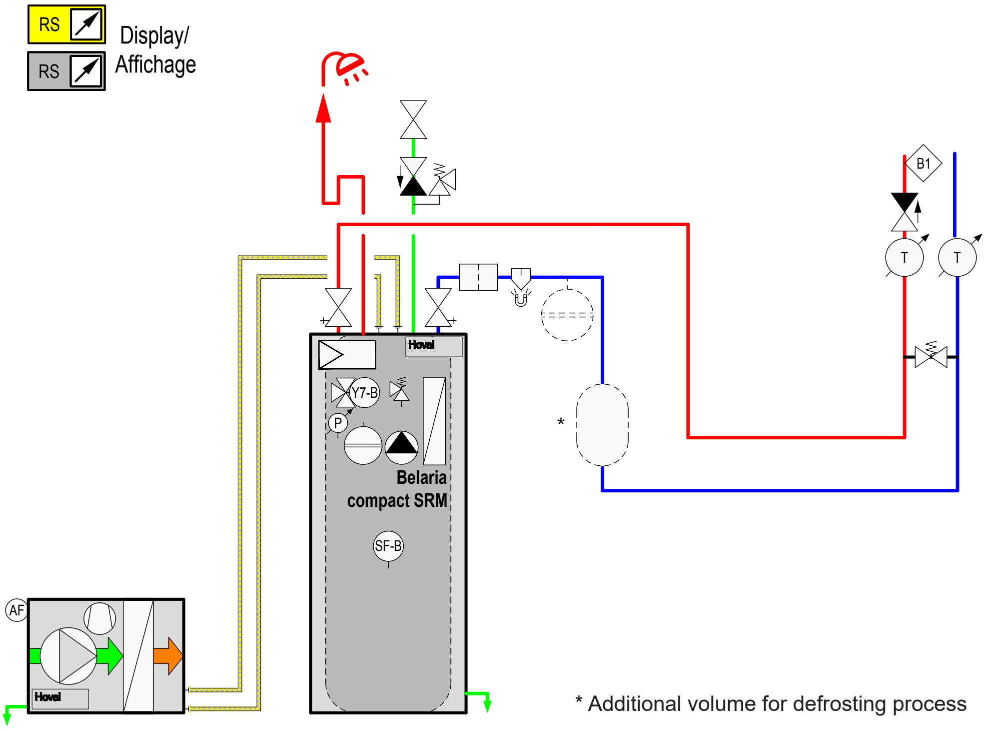
Necessity of an oil separator

If the outdoor unit is placed lower than the indoor unit, an oil separator must be bent or installed in the hot gas line for each 10 m of height difference (siphon). The oil separator prevents the compressor oil flowing back after switching off and thus slugging which could damage the compressor.

Further guidelines
see “Engineering”

Belaria® compact SRM
Air/water heat pump with
- integrated calorifier
- 1 direct circuit

Hydraulic schematic BBABE010



* Additional volume for defrosting process

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

AF	Outdoor sensor
Y7-B	Switching valve (Belaria® SRM)
SF-B	Calorifier sensor

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.

Seal of approval FWS
The UltraSource® B series is certified by the CH certification commission.

The built-in high-efficiency pumps fulfil the Eco-design requirements of 2015 with an EEI of ≤ 0.23.

Model range

UltraSource® B comfort C Type	35 °C	55 °C	Heat output [1)] A-7W35 kW	 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	 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

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 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/CU
- Integrated components:
  - Speed-regulated high-efficiency pump
  - Flow sensor/flow meter or heat meter
  - E-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 connecting 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/CU
- Integrated calorifier 200 litres (can be divided for easier transport into the building; weight 1294 x 770 x 602)
- 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
  - E-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 “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
- 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 connecting 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 (DB703)
- 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 DHW charging circuit
  - Bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast5 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”

Delivery
- Indoor and outdoor unit delivered
- packaged separately
- Sensor set in the indoor unit supplied loose

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

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

Part No.

Air/water heat pump

Energy efficiency class
see "Description"

Modulating air/water heat pump
for heating and cooling.
Comprising indoor unit and outdoor unit.
UltraSource® B compact C with integrated
calorifier in the indoor unit.

With built-in Hoval TopTronic® E control

Integrated control functions for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer
- 1 DHW charging circuit
- Bivalent and cascade management

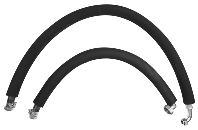
- Can be optionally expanded with max. 1 module expansion:
  - Module expansion heating circuit or
  - Module expansion heat balancing or
  - Module expansion universal
- Can be optionally networked with up to 16 controller modules in total (incl. solar module)

Delivery
- Indoor and outdoor unit delivered packaged separately
- Sensor set in the indoor unit supplied loose

Hoval 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 SH25-25-10-2 — 6046 173
for UltraSource® B comfort (8-17),
Belaria® comfort ICM (8)
Consisting of:
flexible connection hoses for
heating side insulated 1″
L = 1.0 m, can be shortened on one side

Hoval UltraSource® B compact C
with integrated 200 litre calorifier.

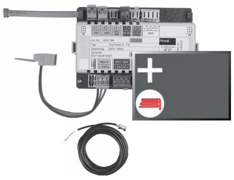
Type	Heat output [1)] A-7W35 kW	 A2W35 kW	Cooling capacity [1)] A35W18 kW	Part No.
(8/200)	2.0-6.0	2.1-7.6	2.9-8.9	7016 660
(11/200)	2.8-10.0	2.8-10.2	3.5-11.0	7016 663

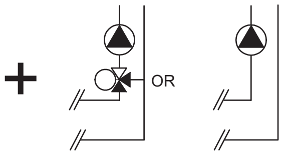
[1)] Modulation range

No hose set necessary

Part No.

TopTronic® E module expansions
for TopTronic® E basic module heat generator





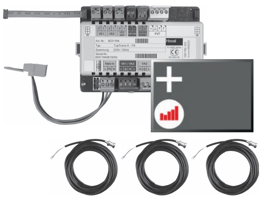
TopTronic® E module expansion heating circuit TTE-FE HK
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

incl. assembly material
1x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

6034 576



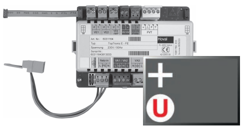
TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

each incl. energy balancing

incl. assembly material
3x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

incl. assembly material

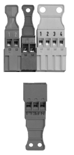
Can be installed in:
Boiler control, wall housing, control panel

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.

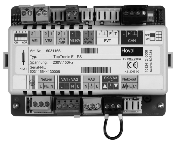
6034 575

Accessories for TopTronic® E



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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776

System housing

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

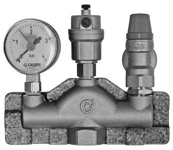
	Part No.
Bivalent switch	2061 826

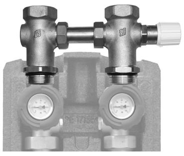
Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

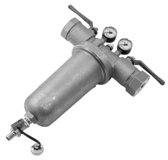
Further information
see “Controls”

Heating/cooling 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 automatic air vent with cut off valve Connection: 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 expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
Bypass valve DN 32 (1¼″) for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m³/h with self-sealing screw connection for mounting between flow and return ball valve	6014 849
System water protection filter Type: 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 loss. 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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: (∆p<0.1 bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C	2076 374
Strainers see “Various system components”	







Notice:
Fulfills the function of sludge separator and strainer

	Part No.

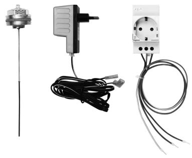
Dew point switch FAS
mechanical dew point switch
for monitoring the
formation of condensation using
adjustable switching value

2070 911

Domestic hot water accessories

Warm water set SW25-25-10-1MD
for UltraSource® B comfort C,
UltraSource® T comfort,
Belaria® comfort ICM (8)
Consisting of:
Motor drive for installed
changeover valve
Includes distance wave and flexible
connection hose insulated 1″
L = 1.0 m

6046 181



Titanium impressed current anode
for UltraSource® B compact C,
UltraSource® T compact
Belaria® pro compact
as cathodic protection for
enamelled calorifier

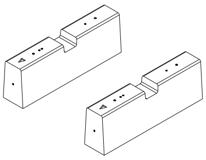
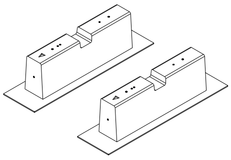
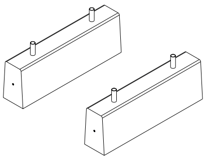
6046 662

In every case, either a Correx electrical anode or a magnesium anode may be used.

Screw-in electric heating element
for plants with buffer storage tank
as emergency heating.

Type	Heat output [kW]	Install. length [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560

Outdoor unit accessories

		Part No.
	**Concete base set BSW01-FU** to securely erect an outdoor unit on solid ground. Consisting of: 2 concrete bases with molded fastening sleeves, screw set Weight: 2 pieces of 58 kg	6046 157
	Also order M10 vibration damper set	
	**Concrete base set BSW01-FD** to securely erect an outdoor unit on flat roof. Consisting of: 2 concrete bases with molded fastening sleeves, protective mats with aluminium facing, screw set Weight: 2 pieces of 58 kg	6046 158
	Also order M10 vibration damper set	
	**Concrete base set BSW01-ZS** to securely erect an outdoor unit in drainage bed for gardens and meadows. Additional base height 250 mm for plug combination with set BSW01-FU Consisting of: 2 additional concrete bases, screw set Weight: 2 pieces of 58 kg	6046 159
	**Vibration damper set M10** for installing the unit on a concrete base.	6043 779

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

Type		**(8)**	**(11)**	**(17)**	**(8/200)**	**(11/200)**
• Energy efficiency class of the compound system with control	35 °C / 55 °C	A+++/A++	A+++/A++	A+++/A+++	A+++/A++	A+++/A++
• Energy efficiency class load profile XL	Hot water	-	-	-	A	A
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.1/3.7	4.5/3.4	5.2/3.9	5.1/3.7	4.5/3.4
Max./min. performance data heating and cooling in acc. with EN 14511						
• Max. heat output A2W35	kW	7.6	10.2	17.4	7.6	10.2
• Max. heat output A-7W35	kW	6.0	10.0	14.8	6.0	10.0
• Max. heat output A15W35	kW	2.6	4.0	6.1	2.6	4.0
• Max. cooling capacity A35W18	kW	8.9	11.0	17.7	8.9	11.0
• Max. cooling capacity A35W7	kW	6.3	8.6	14.2	6.3	8.6
• Max. cooling capacity A35W18	kW	2.9	3.5	6.2	2.9	3.5
Nominal performance data heating in acc. with EN 14511						
• Nominal heat output A2W35	kW	3.9	5.9	11.3	3.9	5.9
• Power consumption A2W35	kW	0.9	1.4	2.5	0.9	1.3
• Coefficient of performance A2W35	COP	4.4	4.4	4.5	4.4	4.4
• Nominal heat output A7W35	kW	4.5	6.8	12.8	4.5	6.8
• Power consumption A7W35	kW	0.9	1.3	2.5	0.9	1.3
• Coefficient of performance A7W35	COP	5.2	5.1	5.1	5.2	5.1
• Nominal heat output A-7W35	kW	2.7	4.4	8.7	3	4.4
• Power consumption A-7W35	kW	0.9	1.3	2.6	0.9	1.3
• Coefficient of performance A-7W35	COP	3.4	3.3	3.3	3.4	3.3
Performance data (cooling) in acc. with EN 14511						
• Nominal heat output A35W18	kW	5	7.8	12	5	7.8
• Power consumption A35W18	kW	1	1.8	2.7	1	1.8
• Coefficient of performance A35W18	EER	4.8	4.3	4.4	4.8	4.3
• Nominal heat output A35W7	kW	3.8	5.4	8.5	3.8	5.4
• Power consumption A35W7	kW	1	1.7	2.5	1	1.7
• Coefficient of performance A35W7	EER	3.7	3.1	3.4	3.7	3.1
Sound data						
• Sound power level EN 12102 outdoor unit 5) 6)	dB (A)	46	50	57	46	50
• Sound pressure level 5 m 4) 5)	dB (A)	27	31	38	27	31
• Sound pressure level 10 m 4) 5)	dB (A)	21	25	32	21	25
• Sound power level EN 12102 indoor unit	dB (A)	42	46	45	42	46
Hydraulic data						
• Max. flow temperature (without/with screw-in electrical heating inset)	°C	62/65	62/65	62/65	62/65	62/65
• Max. flow heating water with A7/W35, 5K ΔT	m^3/h	1,5	2,2	3,7	1,5	2,2
• Residual overpressure of heating pump (at max. pump speed)	kPa	65	57	37	65	57
• Max. operating pressure on the heating side	bar	3	3	3	3	3
• Max. operating pressure process water side	bar	-	-	-	10	10
• Flow/return connection heating	R	1″	1″	1″	1″	1″
• Cold/hot water connection	R	-	-	-	¾″	¾″
• Nominal air volume outdoor unit (A7W35 and nominal rotation speed)	m^3/h	2500	3600	5000	2500	3600
Cooling technical data						
• Refrigerant		R410A	R410A	R410A	R410A	R410A
• Compressor/stages		Inverter/1	Inverter/1	Inverter/1	Inverter/1	Inverter/1
• Refrigerant filling quantity	kg	3.2	4.1 (up to 6 m)	4.8	3.2	4.1 (up to 6 m)
• Compressor oil filling quantity	l	0.35/FV50S	0.99/FV50S	1/FVC68D	0.35/FV50S	0.99/FV50S
• Refrigerant line connections suction gas side	mm	12 x 1	16 x 1	18 x 1	12 x 1	16 x 1
• Refrigerant line connections liquid side	mm	10 x 1	12 x 1	12 x 1	10 x 1	12 x 1
• Max. refrigerant line length (metric)	m	16	16	16	16	16
• Max. refrigerant line length (inch)	m	20	20	20	20	20
• Max. difference in height 3)	m	10	10	10	10	10

Type		**(8)**	**(11)**	**(17)**	**(8/200)**	**(11/200)**
Electrical data						
• Electrical connection compressor	V / Hz	1~230/50	3~400/50	3~400/50	1~230/50	3~400/50
• Electrical connection electric heating element	V / Hz	1~230/50 3~400/50	3~400/50	3~400/50	1~230/50 3~400/50	3~400/50
• Control electrical connection	V / Hz	1~230/50	1~230/50	1~230/50	1~230/50	1~230/50
• Max. compressor operating current	A	15.8	9	14.8	15.8	9
• Max. compressor starting current	A	15.8	9	14.8	15.8	9
• Max. fan operating current	A	0.21	0.5	0.5	0.21	0.5
• Max. fan power consumption	W	48	113	113	48	113
• Max. electric heating element operating current	A	13	13	13	13	13
• Output factor		0.94	0.97	0.95	0.94	0.97
• Main current fuse	A	16	13	16	16	13
- Type		C,K	C,K	C,K	C,K	C,K
• Control current fuse	A	13	13	13	13	13
- Type		B,Z	B,Z	B,Z	B,Z	B,Z
• Fuse electric heating element	A	13	13	13	13	13
- Type		B,Z	B,Z	B,Z	B,Z	B,Z
Dimensions / weight of indoor unit						
• Dimensions (H x W x D)	mm			see Dimensions		
• Tilting measure	mm	-	-	-	2150	2150
• Weight	kg	185	209	211	282	305
• Minimum sizes of installation room [1]	m^3	7.3	9.3	10.9	7.3	9.3
Dimensions / weight of outdoor unit						
• Dimensions (H x W x D)	mm	1200x1090x745		1546x1090x745	1200x1090x745	
• Weight	kg	144	144	177	144	144
Hot water storage tank						
• Storage capacity	l	-	-	-	192	192
• Maximum storage tank temperature	°C	-	-	-	55	55
• Maximum storage tank temperature with electric heating element	°C	-	-	-	75	75
• Output capacity at 46 °C draw-off temperature - heat pump [2]	l	-	-	-	260	260
• Output capacity at 40 °C draw-off temperature - heat pump [2]	l	-	-	-	315	315

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

[2] 12 °C cold water temperature/58 °C storage tank temperature

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

[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.

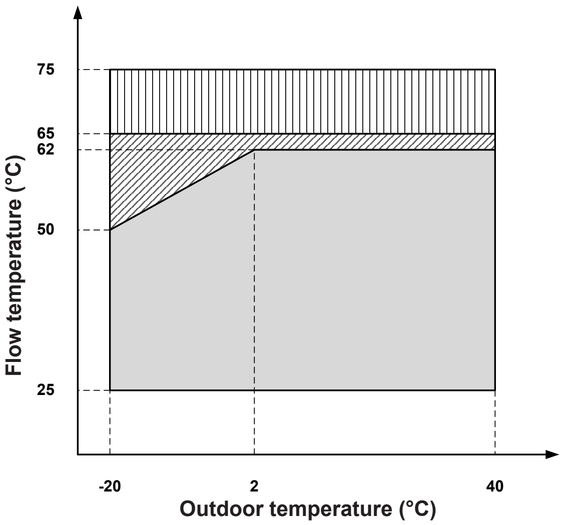
[5] The sound values apply with a clean evaporator. These values are temporarily exceeded before defrosting.

[6] The sound power level is reduced by 4 dB(A) in whisper mode.

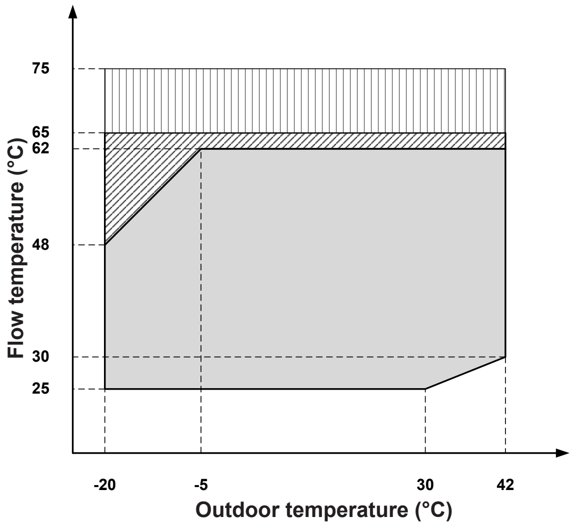
Diagrams of areas of application

Heating and hot water

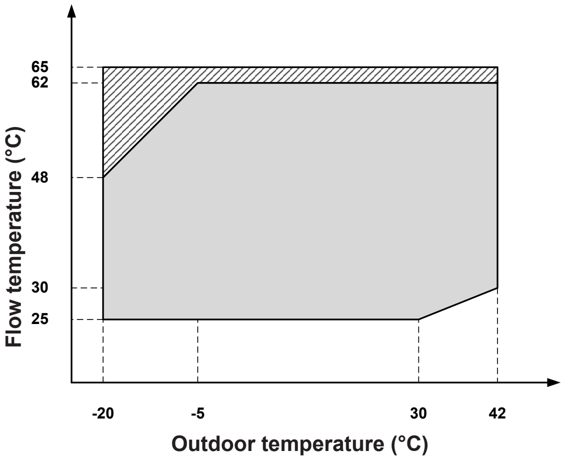
UltraSource® B comfort C (8)
UltraSource® B compact C (8/200)



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



UltraSource® B comfort C (17)



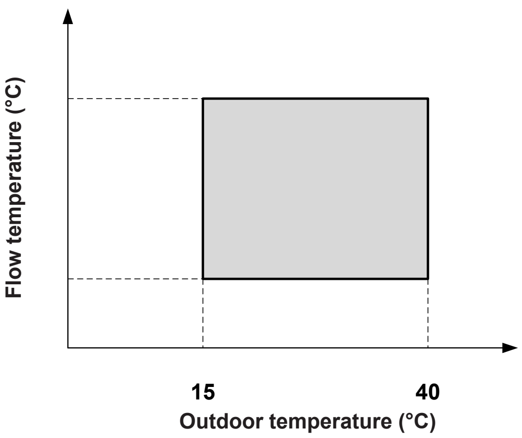
▒ Area of application heating/domestic hot water heat pump (UltraSource® B comfort C and compact C)

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

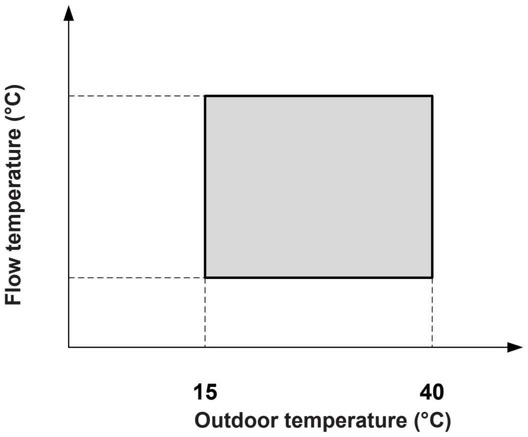
▥ Extended area of application domestic hot water heat pump including electric heating element

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 cooling heat pump (UltraSource® B comfort C and compact C)

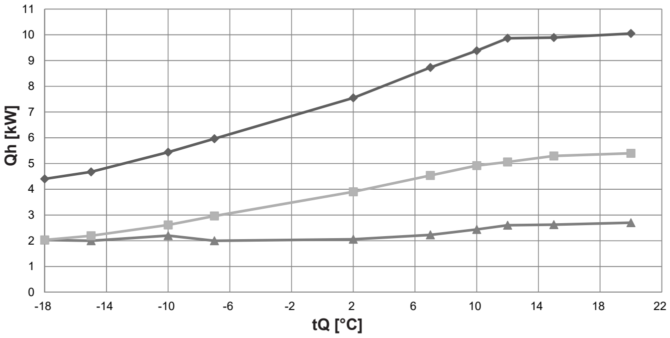
Performance data – heating

Maximum heat output allowing for defrosting losses

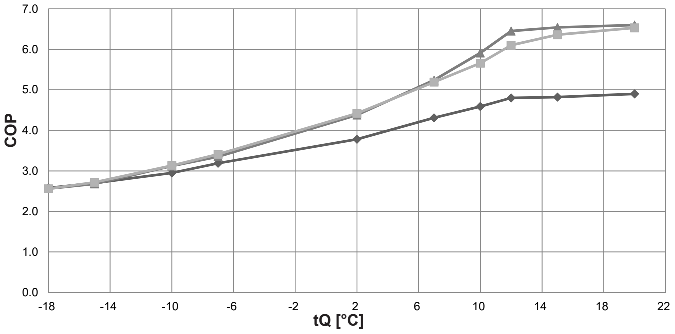
UltraSource® B comfort C (8), compact C (8/200)

Data according to EN 14511

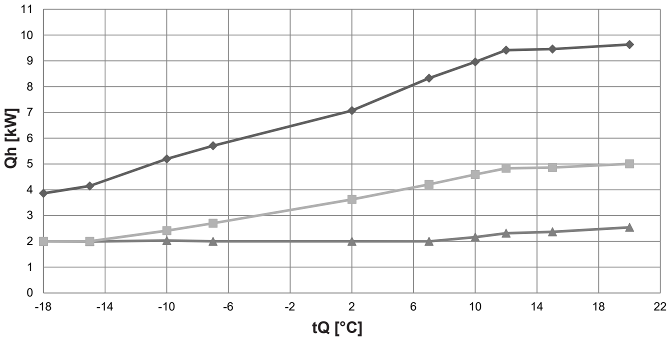
Heat output - t_{FL} 35 °C



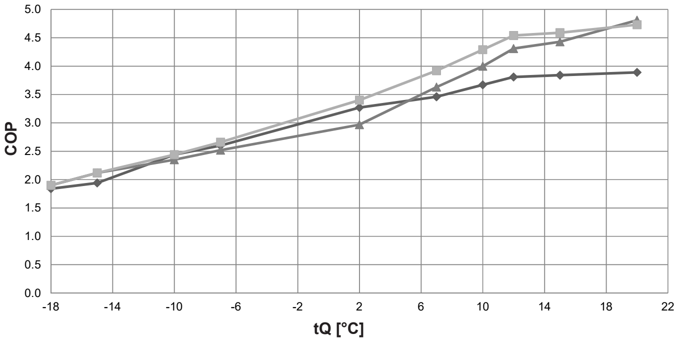
Coefficient of performance - t_{FL} 35 °C



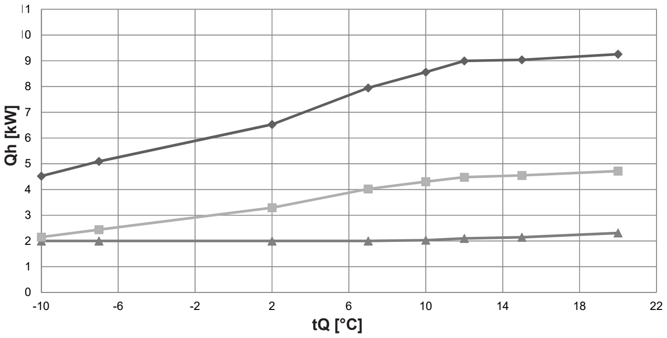
Heat output - t_{FL} 45 °C



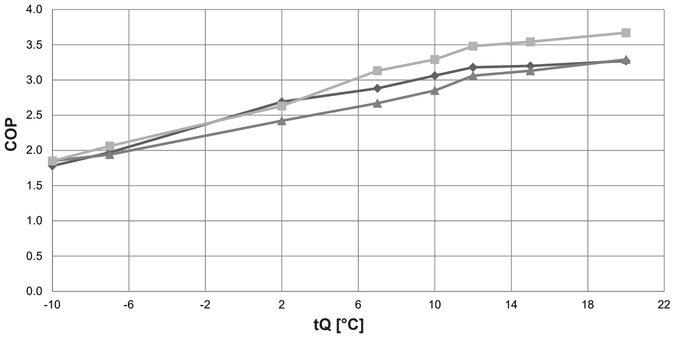
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 55 °C



Coefficient of performance - t_{FL} 55 °C



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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
—■— Nominal output
—▲— Minimum output

Performance data – heating

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

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	**tQ °C**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**
35	-18	4.4	1.7	2.6	2	0.8	2.6	2	0.8	2.6
	-15	4.7	1.7	2.7	2.2	0.8	2.7	2	0.8	2.7
	-10	5.4	1.8	3	2.6	0.8	3.1	2.2	0.7	3.1
	-7	6	1.9	3.2	2.7	0.9	3.4	2	0.6	3.4
	2	7.6	2	3.8	3.9	0.9	4.4	2.1	0.5	4.4
	7	8.7	2	4.3	4.5	0.9	5.2	2.2	0.4	5.2
	10	9.4	2	4.6	4.9	0.9	5.7	2.4	0.4	5.9
	12	9.9	2.1	4.8	5.1	0.8	6.1	2.6	0.4	6.5
	15	9.9	2.1	4.8	5.3	0.8	6.4	2.6	0.4	6.5
	20	10.1	2.1	4.9	5.4	0.8	6.5	2.7	0.4	6.6
45	-18	3.9	2.1	1.8	2	1.1	1.9	2	1.1	1.9
	-15	4.2	2.1	1.9	2	0.9	2.1	2	0.9	2.1
	-10	5.2	2.1	2.4	2.4	1	2.4	2	0.9	2.4
	-7	5.7	2.2	2.6	2.7	1	2.7	2	0.8	2.5
	2	7.1	2.2	3.3	3.6	1.1	3.4	2	0.7	3
	7	8.3	2.4	3.5	4.2	1.1	3.9	2	0.6	3.6
	10	9	2.4	3.7	4.6	1.1	4.3	2.2	0.5	4
	12	9.4	2.5	3.8	4.8	1.1	4.5	2.3	0.5	4.3
	15	9.5	2.5	3.8	4.9	1.1	4.6	2.4	0.5	4.4
	20	9.6	2.5	3.9	5	1.1	4.7	2.5	0.5	4.8
50	-18	2.9	2.3	1.3	2	1.3	1.5	2.0	1.3	1.6
	-15	3.4	2.3	1.5	2	1.2	1.7	2.0	1.2	1.7
	-10	4.7	2.3	2.0	2.3	1.1	2	2.1	1.0	2.1
	-7	5.3	2.4	2.2	2.6	1.2	2.2	2.0	0.9	2.2
	2	6.8	2.3	2.9	3.5	1.2	2.9	2.0	0.7	2.8
	7	8.2	2.6	3.1	4.1	1.2	3.4	2.1	0.7	2.9
	10	8.8	2.6	3.4	4.5	1.2	3.7	2.1	0.6	3.4
	12	9.2	2.6	3.5	4.7	1.2	3.9	2.2	0.6	3.6
	15	9.2	2.6	3.5	4.7	1.2	3.9	2.3	0.6	3.7
	20	9.5	2.6	3.6	4.9	1.2	4.1	2.4	0.6	3.8
55	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	4.5	2.5	1.8	2.2	1.2	1.9	2	1.1	1.9
	-7	5.1	2.6	2	2.4	1.2	2.1	2	1	1.9
	2	6.5	2.4	2.7	3.3	1.3	2.6	2	0.8	2.4
	7	8	2.8	2.9	4	1.3	3.1	2	0.8	2.7
	10	8.6	2.8	3.1	4.3	1.3	3.3	2	0.7	2.9
	12	9	2.8	3.2	4.5	1.3	3.5	2.1	0.7	3.1
	15	9	2.8	3.2	4.6	1.3	3.5	2.2	0.7	3.1
	20	9.3	2.8	3.3	4.7	1.3	3.7	2.3	0.7	3.3
60 (92 %)	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	4.9	2.6	1.9	2.3	1.2	1.9	1.9	1.0	1.9
	2	6.1	2.4	2.5	3.1	1.3	2.4	1.9	0.8	2.3
	7	7.8	3.0	2.6	3.9	1.4	2.9	2.0	0.9	2.3
	10	8.4	3.0	2.8	4.2	1.4	2.9	2.0	0.8	2.6
	12	8.6	3.0	2.9	4.3	1.4	3.1	2.0	0.8	2.7
	15	8.6	3.0	2.9	4.4	1.4	3.1	2.1	0.8	2.8
	20	9.1	3.0	3.0	4.6	1.4	3.3	2.3	0.8	3.0

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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”

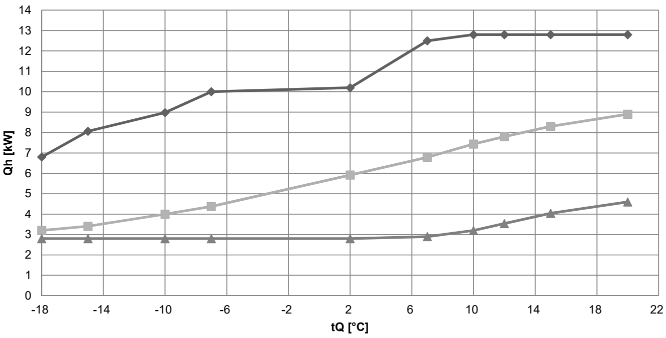
Performance data – heating

Maximum heat output allowing for defrosting losses

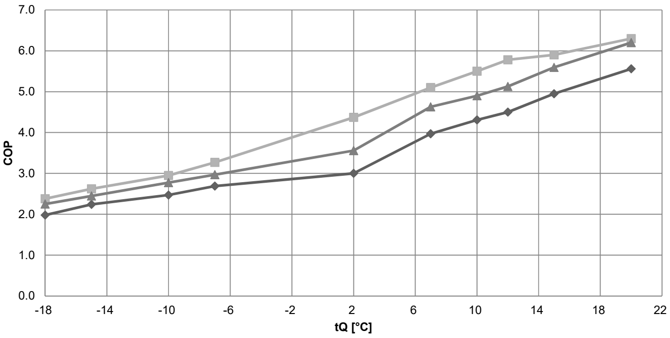
UltraSource® B comfort C (11), compact C (11/200)

Data according to EN 14511

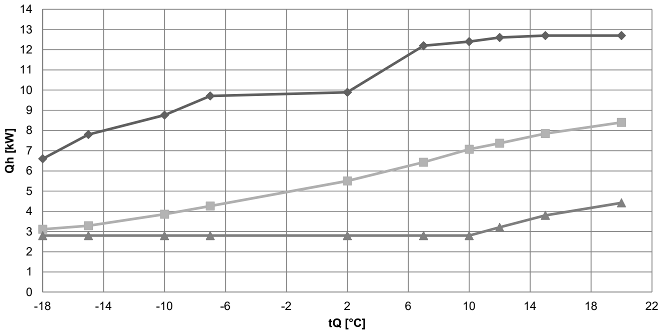
Heat output - t_{FL} 35 °C



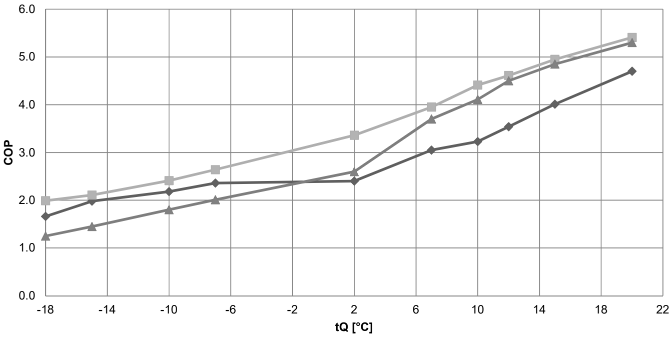
Coefficient of performance - t_{FL} 35 °C



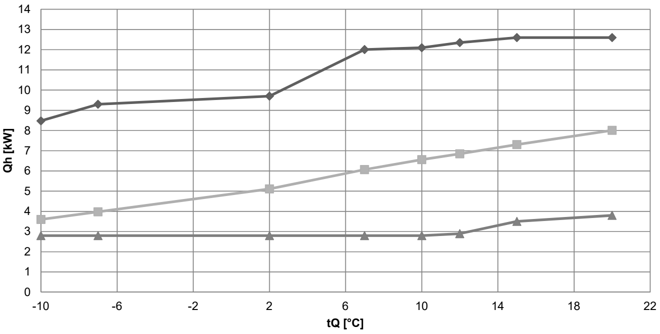
Heat output - t_{FL} 45 °C



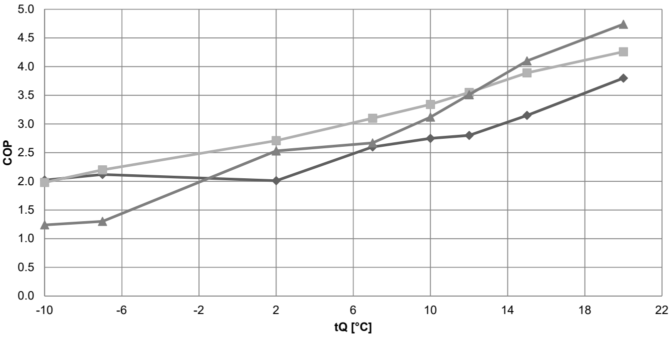
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 55 °C



Coefficient of performance - t_{FL} 55 °C



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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

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

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	**tQ °C**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**
35	-18	6.8	3.4	2.0	3.2	1.3	2.4	2.8	1.2	2.3
	-15	8.1	3.6	2.2	3.4	1.3	2.6	2.8	1.1	2.5
	-10	9.0	3.6	2.5	4.0	1.4	3.0	2.8	1.0	2.8
	-7	10.0	3.7	2.7	4.4	1.3	3.3	2.8	0.9	3.0
	2	10.2	3.4	3.0	5.9	1.4	4.4	2.8	0.8	3.6
	7	12.5	3.2	4.0	6.8	1.3	5.1	2.9	0.6	4.6
	10	12.8	3.0	4.3	7.4	1.4	5.5	3.2	0.7	4.9
	12	12.8	2.9	4.5	7.8	1.4	5.8	3.5	0.7	5.1
	15	12.8	2.6	5.0	8.3	1.4	5.9	4.0	0.7	5.6
	20	12.8	2.3	5.6	8.9	1.4	6.3	4.6	0.7	6.2
45	-18	6.6	4.0	1.7	3.1	1.6	2.0	2.8	2.2	1.3
	-15	7.8	3.9	2.0	3.3	1.6	2.1	2.8	1.9	1.5
	-10	8.8	4.0	2.2	3.9	1.6	2.4	2.8	1.6	1.8
	-7	9.7	4.1	2.4	4.3	1.6	2.6	2.8	1.4	2.0
	2	9.9	4.1	2.4	5.5	1.6	3.4	2.8	1.1	2.6
	7	12.2	4.0	3.1	6.4	1.6	4.0	2.8	0.8	3.7
	10	12.4	3.8	3.2	7.1	1.6	4.4	2.8	0.7	4.1
	12	12.6	3.6	3.5	7.4	1.6	4.6	3.2	0.7	4.5
	15	12.7	3.2	4.0	7.9	1.6	5.0	3.8	0.8	4.9
	20	12.7	2.7	4.7	8.4	1.6	5.4	4.4	0.8	5.3
50	-18	6.4	4.2	1.5	3.0	1.7	1.8	2.7	2.4	1.1
	-15	7.4	4.2	1.8	3.1	1.7	1.9	2.6	2.0	1.3
	-10	8.6	4.1	2.1	3.7	1.7	2.2	2.8	1.9	1.5
	-7	9.5	4.3	2.2	4.1	1.7	2.4	2.8	1.8	1.6
	2	9.8	4.5	2.2	5.3	1.8	3.0	2.8	1.1	2.6
	7	12.1	4.3	2.8	6.3	1.8	3.5	2.8	0.9	3.1
	10	12.3	4.1	3.0	6.8	1.8	3.9	2.8	0.8	3.5
	12	12.5	4.0	3.1	7.1	1.7	4.1	3.1	0.8	4.0
	15	12.7	3.6	3.5	7.6	1.7	4.4	3.7	0.8	4.5
	20	12.7	3.0	4.2	8.2	1.7	4.8	4.1	0.8	5.0
55	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	8.5	4.2	2.0	3.6	1.8	2.0	2.8	2.3	1.2
	-7	9.3	4.4	2.1	4.0	1.8	2.2	2.8	2.2	1.3
	2	9.7	4.8	2.0	5.1	1.9	2.7	2.8	1.1	2.5
	7	12.0	4.6	2.6	6.1	2.0	3.1	2.8	1.1	2.7
	10	12.1	4.4	2.8	6.6	2.0	3.3	2.8	0.9	3.1
	12	12.4	4.4	2.8	6.9	1.9	3.6	2.9	0.8	3.5
	15	12.6	4.0	3.2	7.3	1.9	3.9	3.5	0.9	4.1
	20	12.6	3.3	3.8	8.0	1.9	4.3	3.8	0.8	4.7
62	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	-	-	-	-	-	-	-	-	-
	2	8.3	5.7	1.5	4.8	2.3	2.1	-	-	-
	7	10.4	5.6	1.9	5.7	2.4	2.4	-	-	-
	10	10.9	5.3	2.1	6.3	2.4	2.6	-	-	-
	12	10.9	5.0	2.2	6.6	2.4	2.8	-	-	-
	15	10.9	4.1	2.7	7.0	2.2	3.2	-	-	-
	20	11.2	3.7	3.1	7.8	2.2	3.6	-	-	-

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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"

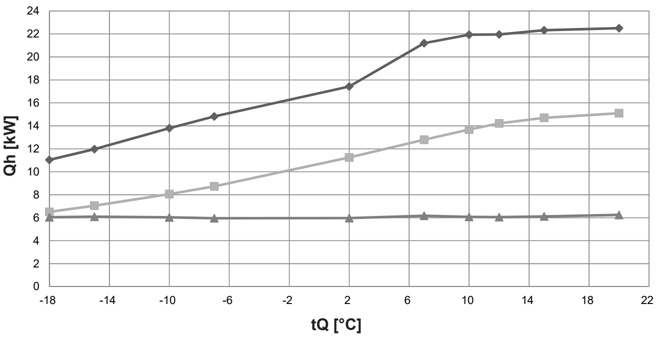
Performance data – heating

Maximum heat output allowing for defrosting losses

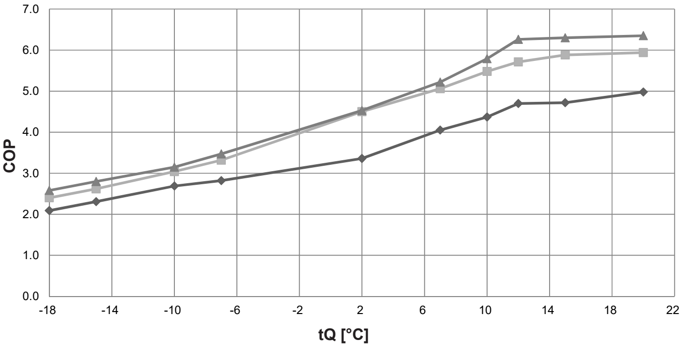
UltraSource® B comfort C (17)

Data according to EN 14511

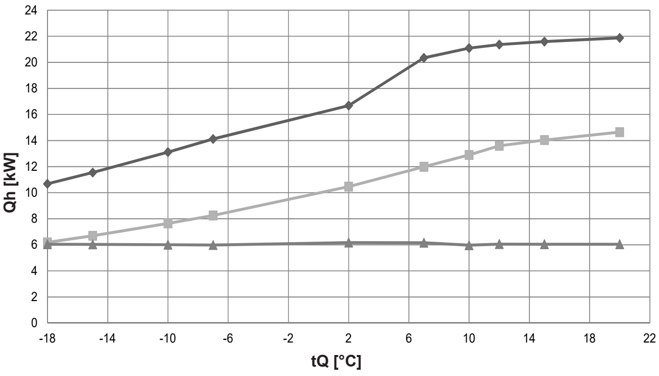
Heat output - t_{FL} 35 °C



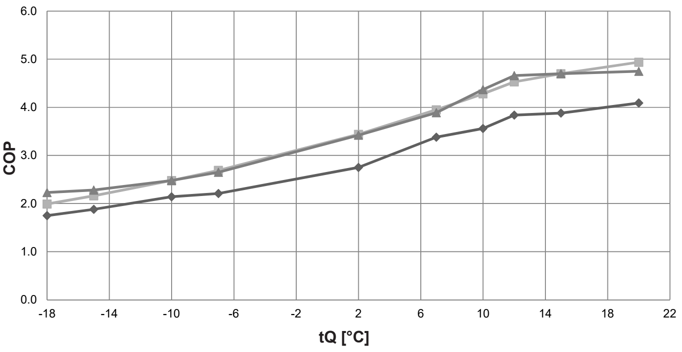
Coefficient of performance - t_{FL} 35 °C



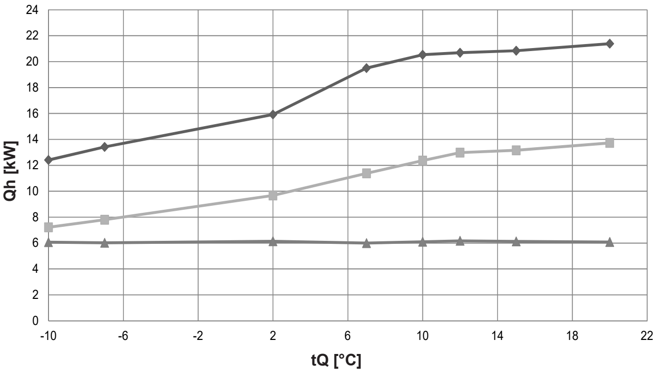
Heat output - t_{FL} 45 °C



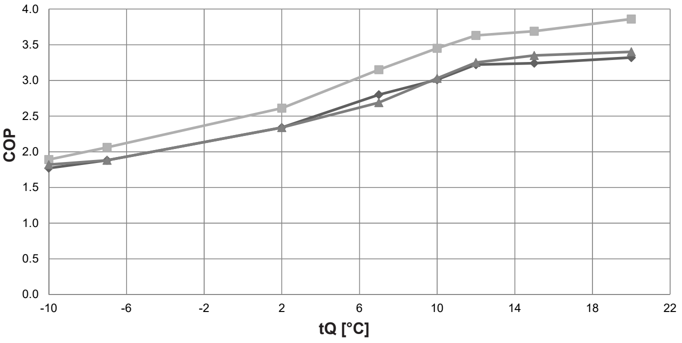
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 55 °C



Coefficient of performance - t_{FL} 55 °C



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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

UltraSource® B comfort C (17)

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-18	11	5.3	2.1	6.5	2.7	2.4	6	2.3	2.6
	-15	12	5.2	2.3	7.1	2.7	2.6	6.1	2.2	2.8
	-10	13.8	5.1	2.7	8.1	2.7	3	6	2	3
	-7	14.8	5.3	2.8	8.7	2.6	3.3	6	1.7	3.5
	2	17.4	5.2	3.4	11.3	2.5	4.5	6.0	1.3	4.5
	7	21.2	5.2	4.1	12.8	2.5	5.1	6.2	1.2	5.2
	10	21.9	5	4.4	13.7	2.5	5.5	6.1	1	5.8
	12	22	4.7	4.7	14.2	2.5	5.7	6.1	1	6.3
	15	22.3	4.7	4.7	14.7	2.5	5.9	6.1	1	6.3
	20	22.5	4.5	5	15.1	2.5	5.9	6.3	1	6.4
45	-18	10.7	6.1	1.8	6.2	3.1	2	6	2.7	2.2
	-15	11.5	6.1	1.9	6.7	3.1	2.2	6	2.6	2.3
	-10	13.1	6.1	2.1	7.6	3.1	2.5	6	2.4	2.5
	-7	14.1	6.4	2.2	8.3	3.1	2.7	6	2.3	2.7
	2	16.7	6.1	2.8	10.5	3	3.4	6.2	1.8	3.4
	7	20.4	6	3.4	12	3	4	6.2	1.6	3.9
	10	21.1	5.9	3.6	12.9	3	4.3	6	1.4	4.4
	12	21.4	5.6	3.8	13.6	3	4.5	6.1	1.3	4.7
	15	21.6	5.6	3.8	14	3	4.7	6	1.3	4.7
	20	21.9	5.4	4.1	14.7	3	4.9	6	1.3	4.8
50	-18	10.5	6.7	1.6	6	3.7	1.6	6.0	3.3	1.8
	-15	11.3	6.6	1.7	6.5	3.7	1.8	6.1	3.2	1.9
	-10	12.8	6.5	2.0	7.4	3.6	2.1	6.1	3.0	2.0
	-7	13.8	6.7	2.1	8	3.6	2.3	6.0	2.8	2.1
	2	16.3	6.4	2.5	10.1	3.5	2.9	6.1	2.3	2.7
	7	19.9	6.6	3.0	11.7	3.4	3.4	6.0	2.0	3.1
	10	20.9	6.4	3.3	12.6	3.4	3.7	6.1	1.8	3.4
	12	21.0	6.0	3.5	13.3	3.4	4	6.1	1.7	3.7
	15	21.3	6.0	3.6	13.6	3.3	4.1	6.1	1.6	3.8
	20	21.7	5.9	3.7	14.2	3.3	4.3	6.1	1.6	3.9
55	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	12.4	7	1.8	7.2	3.8	1.9	6.1	3.3	1.8
	-7	13.4	7.1	1.9	7.8	3.8	2.1	6	3	1.9
	2	15.9	6.8	2.3	9.7	3.7	2.6	6.1	2.6	2.3
	7	19.5	7	2.8	11.4	3.6	3.2	6	2	2.7
	10	20.5	6.8	3	12.4	3.6	3.5	6	2	3
	12	20.7	6.4	3.2	13	3.6	3.6	6.2	2	3.3
	15	20.9	6.4	3.2	13.2	3.6	3.7	6.1	1.8	3.4
	20	21.4	6.4	3.3	13.7	3.6	3.9	6.1	1.8	3.4
62	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	11.9	7.6	1.6	6.9	4.1	1.7	5.8	3.6	1.6
	-7	12.9	7.7	1.6	7.5	4.1	1.8	5.8	3.5	1.6
	2	14.9	7.4	2.0	9.1	4.0	2.3	5.8	2.9	2.0
	7	18.7	7.6	2.4	11.0	3.9	2.8	5.8	2.4	2.4
	10	19.8	7.3	2.7	12.0	3.9	3.1	5.9	2.2	2.7
	12	20.0	6.9	2.9	12.6	3.9	3.2	6.0	2.0	3.0
	15	19.9	6.9	2.9	12.5	3.9	3.2	5.8	2.0	2.9
	20	20.4	6.9	2.9	13.1	3.9	3.4	5.8	1.9	2.9

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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

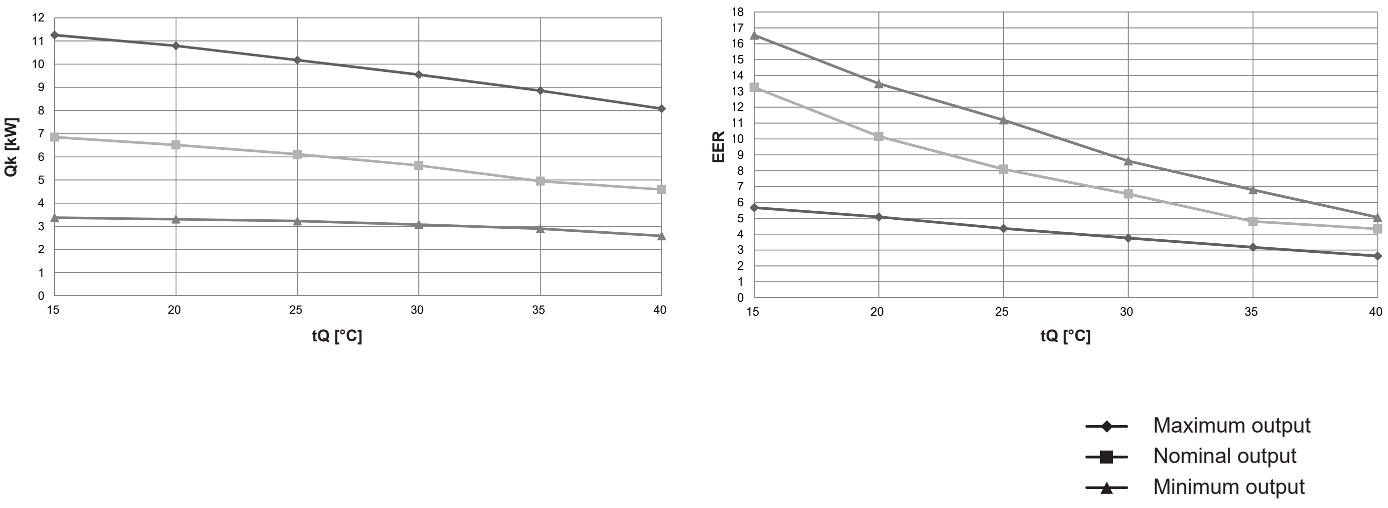
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

Maximum cooling capacity

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

Cooling capacity - t_{VL} 18 °C **Coefficient of performance - t_{FL} 18 °C**



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

Data according to EN 14511

tFL °C	tQ °C	Maximum output Qk kW	Maximum output P kW	Maximum output EER	Nominal output Qk kW	Nominal output P kW	Nominal output EER	Minimum output Qk kW	Minimum output P kW	Minimum output EER
7	15	8.1	1.7	4.8	4.7	0.6	7.8	2.4	0.2	10.1
	20	7.7	1.9	4.1	4.5	0.7	6.4	2.2	0.3	7.5
	25	7.3	2.1	3.5	4.3	0.8	5.3	2.1	0.4	5.9
	30	6.8	2.3	3	4	0.9	4.4	2.1	0.5	4.4
	35	6.3	2.4	2.6	3.8	1	3.7	2	0.5	3.8
	40	5.8	2.7	2.2	3.4	1.1	3	2	0.7	3.1
12	15	9.7	1.8	5.3	5.7	0.6	10.1	2.8	0.2	13.6
	20	9.2	2	4.6	5.3	0.7	7.8	2.8	0.3	10.6
	25	8.7	2.2	4	5.1	0.8	6.4	2.6	0.3	8.1
	30	8	2.4	3.4	4.8	0.9	5.3	2.5	0.4	6.4
	35	7.5	2.6	2.9	4.3	1	4.2	2.3	0.5	5.1
	40	6.8	2.8	2.4	4	1.1	3.6	2.2	0.6	3.9
18	15	11.3	2	5.7	6.9	0.5	13.3	3.4	0.2	16.5
	20	10.8	2.1	5.1	6.5	0.6	10.2	3.3	0.3	13.5
	25	10.2	2.3	4.4	6.1	0.8	8.1	3.2	0.3	11.2
	30	9.6	2.6	3.8	5.6	0.9	6.5	3.1	0.4	8.1
	35	8.9	2.8	3.2	5	1	4.8	2.9	0.4	6.8
	40	8.1	3.1	2.6	4.6	1.1	4.3	2.6	0.5	5.1

tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

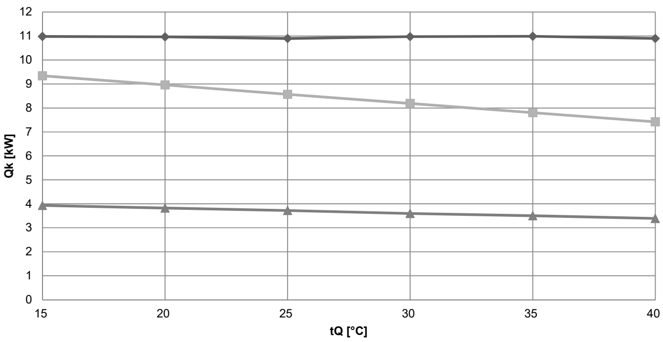
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

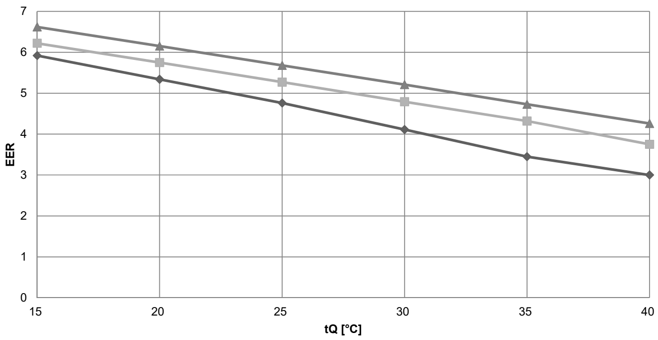
Maximum cooling capacity

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

Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



◆ Maximum output
■ Nominal output
▲ Minimum output

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

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	tQ °C	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER
7	15	11.2	2.4	4.7	6.9	1.4	5.0	2.9	0.6	4.5
	20	10.5	2.5	4.3	6.6	1.5	4.5	2.9	0.7	4.1
	25	9.9	2.6	3.8	6.2	1.5	4.1	3.0	0.8	3.6
	30	9.3	2.8	3.3	5.8	1.6	3.6	3.0	0.9	3.2
	35	8.6	3.0	2.8	5.4	1.7	3.1	2.9	1.1	2.8
	40	8.0	3.4	2.6	5.0	1.9	2.6	2.9	1.2	2.3
12	15	10.8	2.1	5.2	8.0	1.4	5.6	3.1	0.6	5.4
	20	10.9	2.3	4.6	7.7	1.5	5.1	3.0	0.6	5.0
	25	10.8	2.7	4.0	7.3	1.6	4.6	2.9	0.7	4.5
	30	10.8	3.2	3.4	6.9	1.7	4.1	2.8	0.7	4.0
	35	10.1	3.4	3.0	6.5	1.8	3.7	2.9	0.8	3.6
	40	9.5	3.8	2.5	6.1	1.9	3.2	2.9	0.9	3.1
18	15	11.0	1.9	5.9	9.3	1.5	6.2	3.9	0.6	6.6
	20	11.0	2.1	5.3	9.0	1.6	5.8	3.8	0.6	6.2
	25	10.9	2.3	4.8	8.6	1.6	5.3	3.7	0.7	5.7
	30	11.0	2.7	4.1	8.2	1.7	4.8	3.6	0.7	5.2
	35	11.0	3.2	3.5	7.8	1.8	4.3	3.5	0.7	4.7
	40	10.9	3.6	3.0	7.4	2.0	3.8	3.4	0.8	4.3

tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

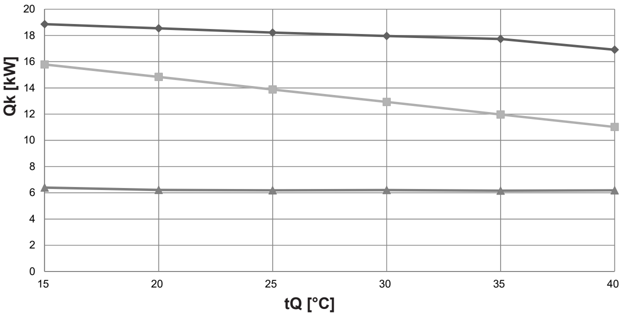
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

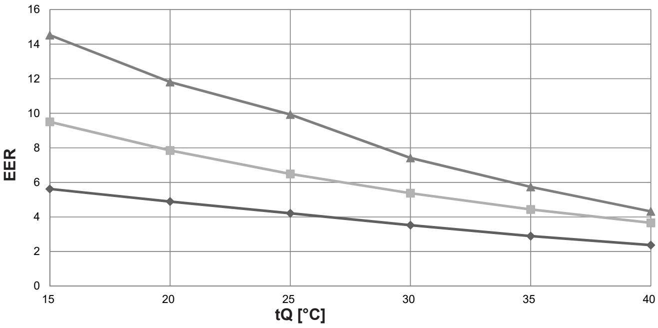
Maximum cooling capacity

UltraSource® B comfort C (17)

Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



◆ Maximum output
■ Nominal output
▲ Minimum output

UltraSource® B comfort C (17)

Data according to EN 14511

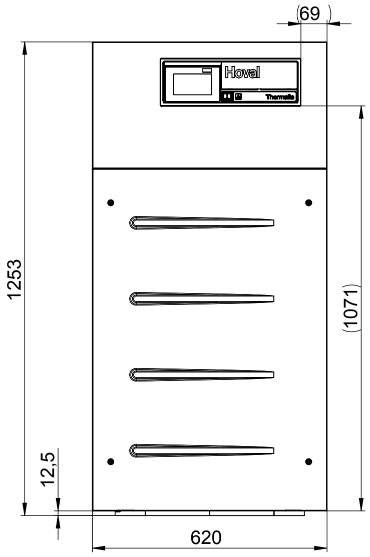
		Maximum output			Nominal output			Minimum output		
tFL °C	tQ °C	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER
7	15	16.5	3.9	4.2	11.2	1.7	6.5	6.2	0.7	8.5
	20	16.2	4.6	3.5	10.5	1.9	5.6	6.2	0.9	7
	25	15.5	5.3	2.9	9.8	2.1	4.7	6.2	1.1	5.7
	30	14.9	6.2	2.4	9.1	2.3	4	6.1	1.3	4.7
	35	14.2	7.7	1.9	8.5	2.5	3.4	6.1	1.6	3.8
	40	13.5	9	1.5	7.9	2.8	2.9	6	1.9	3.1
12	15	18.2	3.7	5	13.4	1.7	7.9	6.3	0.5	11.7
	20	17.9	4.3	4.2	12.6	1.9	6.6	6.1	0.7	9.2
	25	17.2	5	3.5	11.8	2.1	5.6	6.1	0.8	7.3
	30	16.4	5.8	2.8	10.9	2.4	4.6	6.2	1.1	5.6
	35	15.5	7.1	2.2	10	2.6	3.9	6.1	1.4	4.4
	40	14.7	8.2	1.8	9.2	2.9	3.2	6.1	1.7	3.6
18	15	18.9	3.4	5.6	15.8	1.7	9.5	6.4	0.4	14.5
	20	18.5	3.8	4.9	14.8	1.9	7.9	6.2	0.5	11.8
	25	18.2	4.3	4.2	13.9	2.1	6.5	6.2	0.6	9.9
	30	18	5.1	3.5	12.9	2.4	5.4	6.2	0.8	7.4
	35	17.7	6.1	2.9	12	2.7	4.4	6.2	1.1	5.7
	40	16.9	7.1	2.4	11	3	3.7	6.2	1.4	4.3

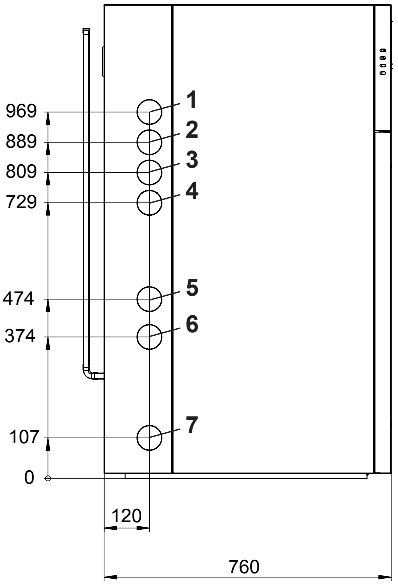
tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption, overall unit (kW)
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

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

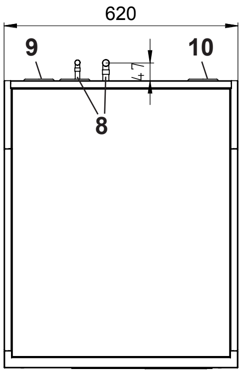
UltraSource® B comfort C (8-17)
Indoor unit

(Dimensions in mm)





View from above



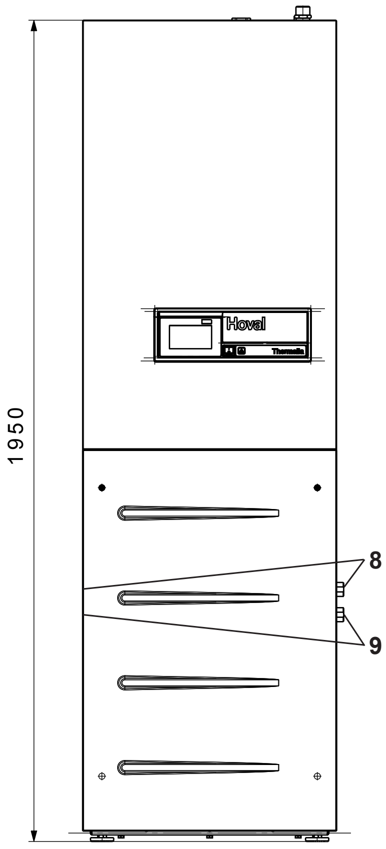
Connections (1-7) optionally on the left or right

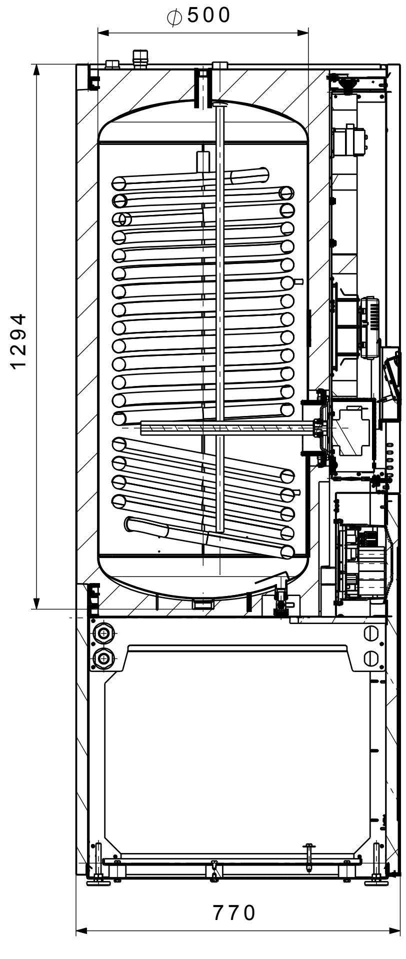
1 Free
2 Flow heating 1″
3 Flow hot water charging 1″
4 Free
5 Free
6 Free
7 Return heating 1″
8 Refrigerant connecting lines
9 Cable feed-in main current
10 Cable feed-in sensors

The indoor unit must be accessible from above.

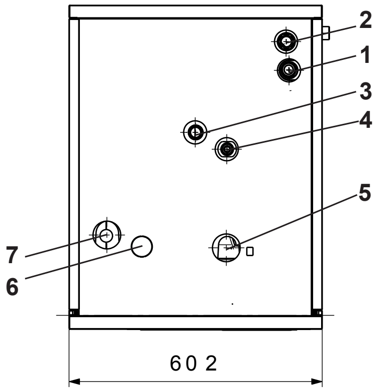
UltraSource® B compact C (8,11/200)
Indoor unit with calorifier

(Dimensions in mm)





View from above

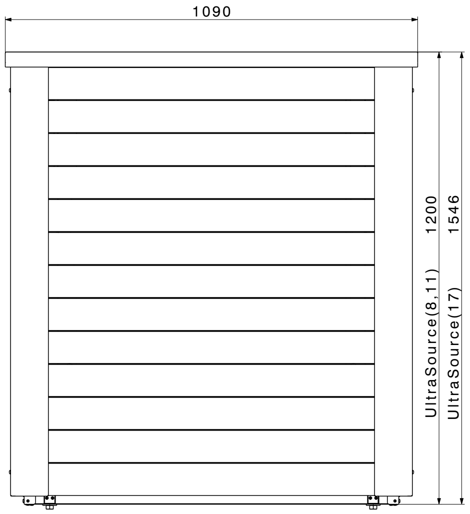


1 Flow heating 1″
2 Return heating 1″
3 Hot water connection ¾″
4 Cold water connection ¾″
5 Cable feed-in sensors
6 Circulation connection ¾″
7 Cable feed-in main current
8 Refrigerant connecting line
9 Refrigerant connecting line

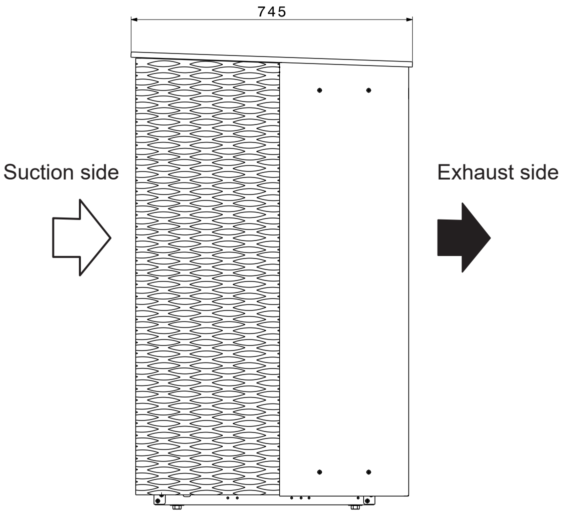
UltraSource® B
Outdoor unit

(Dimensions in mm)

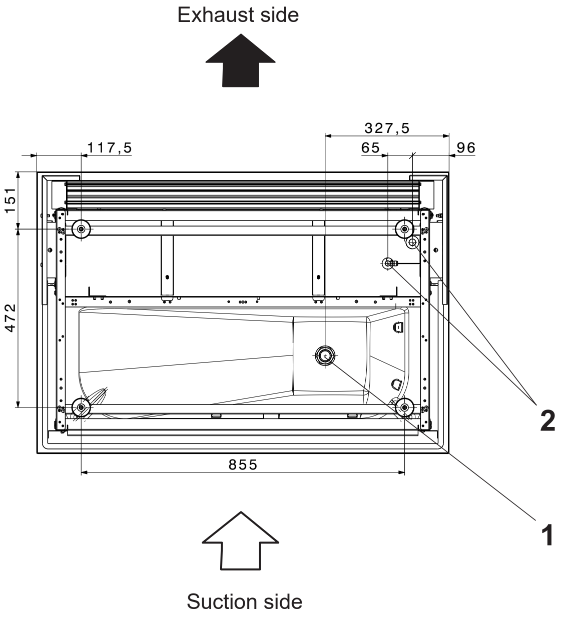
Front view



View from left



View from below

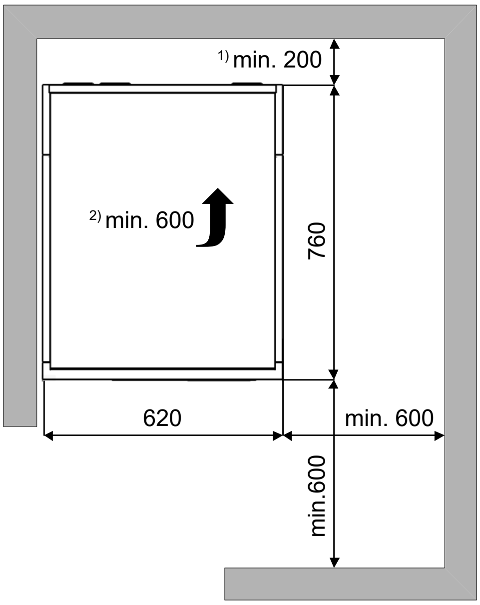


1 Condensate drain (Rp 1″)
2 Refrigerant connecting line connections Ø 10,12,16 or 18

Space requirement

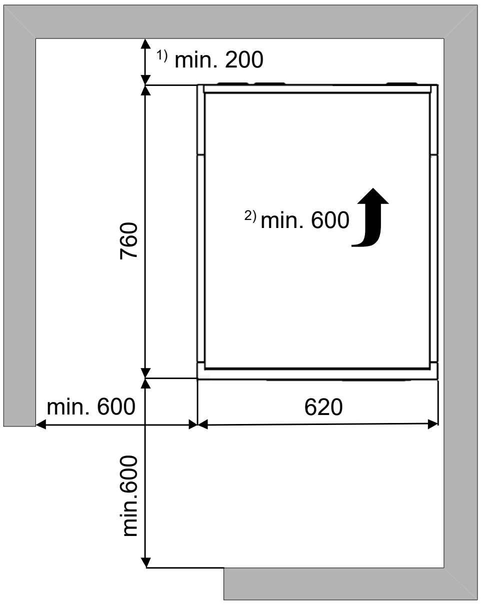
(Dimensions in mm)

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



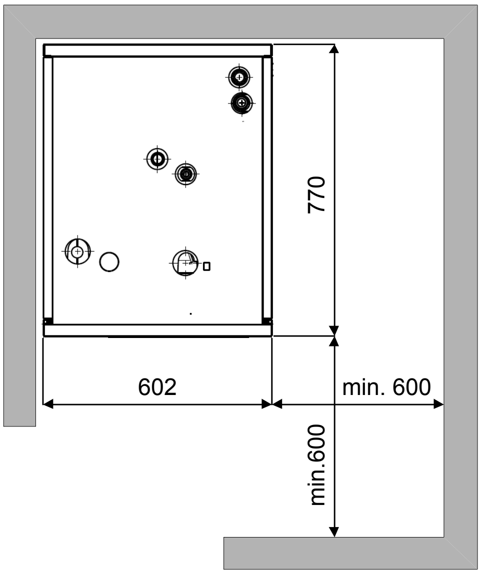
[1] A gap of at least 200 mm must be guaranteed at the rear for the refrigerant as well as electrical connection.

**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)!

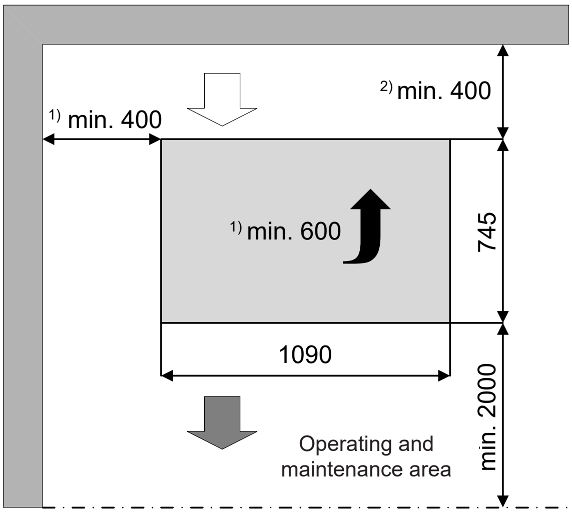
**UltraSource® B compact C (8,11/200)
Indoor unit**



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



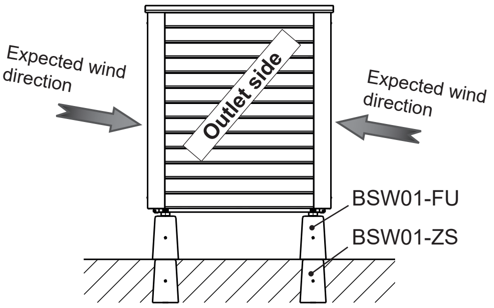
[1] Due to the need for access during maintenance, a gap of 400 mm must be guaranteed on both sides and 600 mm above.

[2] If the air intake grille can not be lifted upwards, there must be a gap of min. 600 mm on the suction side.

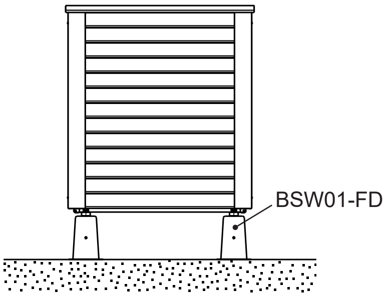
Installation variants UltraSource® B outdoor unit

(Dimensions in mm)

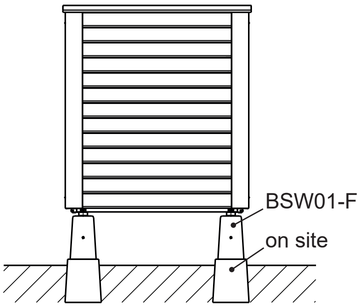
Firm base with Hoval concrete base set

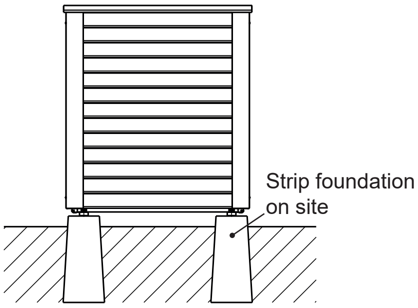


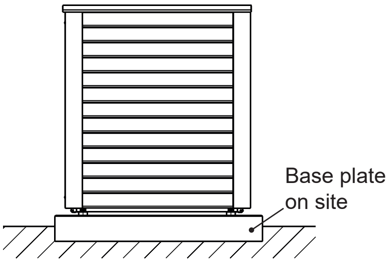
Flat roof or existing firm base



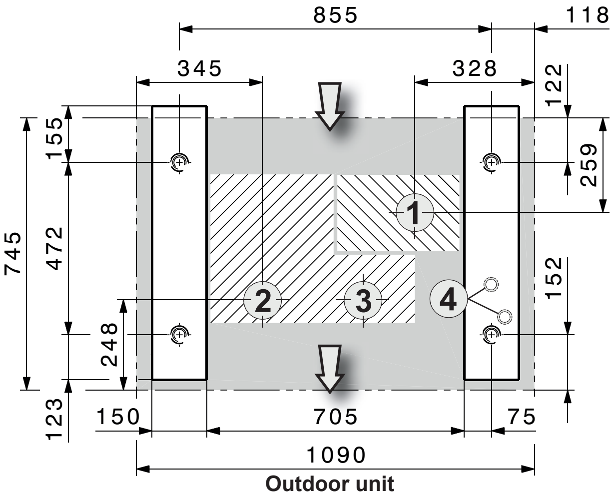
Firm base on site





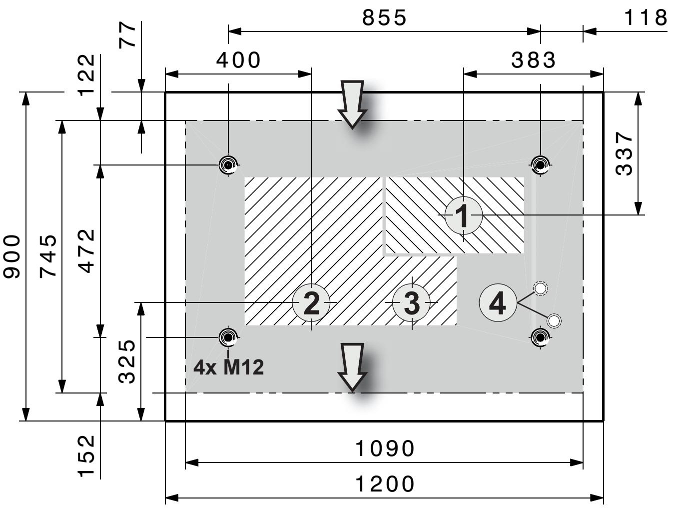


Strip foundation
Plan concrete base set
(view from top)



Outdoor unit

Floor plate
Floor plan
(view from top)

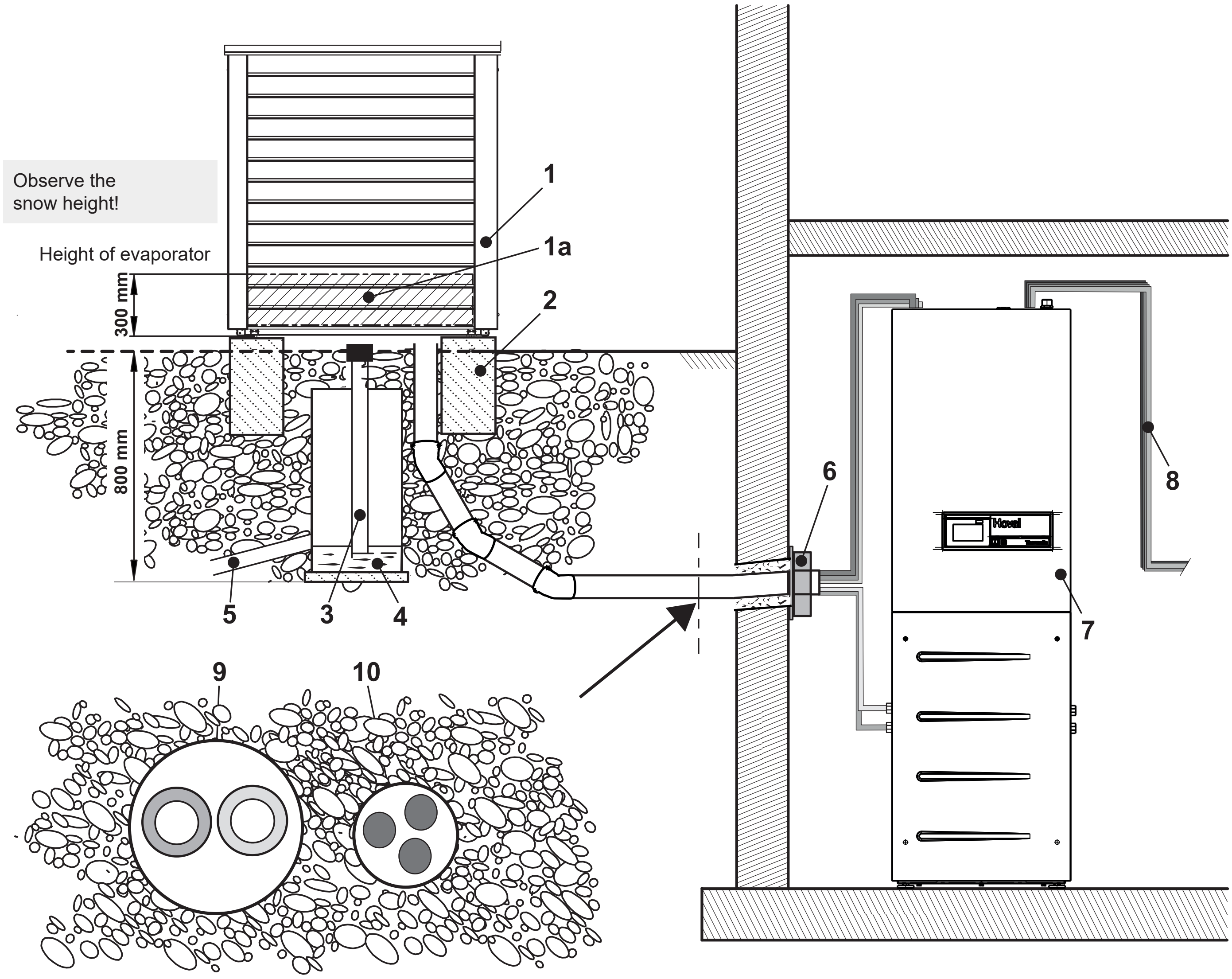


1 Optimum position for condensate drain DN 100
Upper edge of condensate drain 50 - 100 mm above floor level
Alternative: without drain. Infiltration of the condensate into the ground.
2 Optimum position of empty tube DN 150 for refrigerant connection lines
Upper edge of empty tube 50 - 100 mm above strip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

▨ Possible area for empty piping in the concrete base

▧ Possible area for condensate drain in the concrete base

Configuration and connection diagram UltraSource® B



1	UltraSource® outdoor unit			
1a	Space for connection of refrigerant connecting lines, condensate drain etc.			
2	Concrete base			
3	Condensate drain (Rp 1″)			
4	Possible variant with duct / gravel bed			
5	Discharge into the sewer system			
6	Wall lead-through (hydraulic and electrical connections)			
7	UltraSource® indoor unit			
8	Main current			
	for (8):	1x 230 V / 50 Hz		
	for (11,17):	3x 400 V / 50 Hz		
	Control current	1x 230 V / 50 Hz		
	Main current immersion heater			
	for (8):	1x 230 V / 50 Hz (3kW) or 3x 400 V / 50 Hz (6kW)		
	for (11,17):	3x 400 V / 50 Hz (6kW)		
	Network cables (optional)			
9	Plain tube for refrigerant connecting lines	(8)	(11)	(17)
	Suction gas line [mm]:	12 x 1	16 x 1	18 x 1
	Liquid line mm]:	10 x 1	12 x 1	12 x 1
	Max. refrigerant line length [m]:	16	16	16
10	Empty tube for electrical connections for outdoor unit			
	Control current outdoor unit	1x 230 V / 50 Hz		
	Trace heating tape	1x 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 connecting lines guarantees cost effectiveness.
- The maximum permissible length of the lines between the outdoor and indoor unit is 20 m 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.
- Due to efficient water heating, 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 connecting lines are connected, on the right or left side, of the heat pump (see dimensions/space required).
- 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 it is not possible to install in areas subject to strong winds, an additional wind shield in the form of a hedge, for example, should be installed.
- 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 condensation during operation. This can be up to 6 litres per defrost cycle within 2 minutes for the outdoor unit of the UltraSource®.
- The condensate drain must be protected against frost.
- 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.

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. A “zeroing TN-S” can be used instead of the RCCB type B. Country-specific requirements must be complied with. If the “fault-current circuit breaker” safeguard measure is implemented nevertheless by the electrical company, a separate fault-current circuit breaker is recommended for the heat pumps.
- This residual-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.

Routing of refrigerant connecting lines

- If the refrigerant connecting 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
  The refrigerant connecting lines in the building must never be laid flush-mounted.
- Routing in the screed (underlay) must be avoided. If there is no other possibility, especial care is important. The installer should route the refrigerant connecting line in collaboration with Hoval customer service.
- After the refrigerant connecting line has been laid, it must be checked for damage and reinsulated. In case of cooling, condensate can form on the pipes.
- The refrigerant connecting 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 connecting 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.

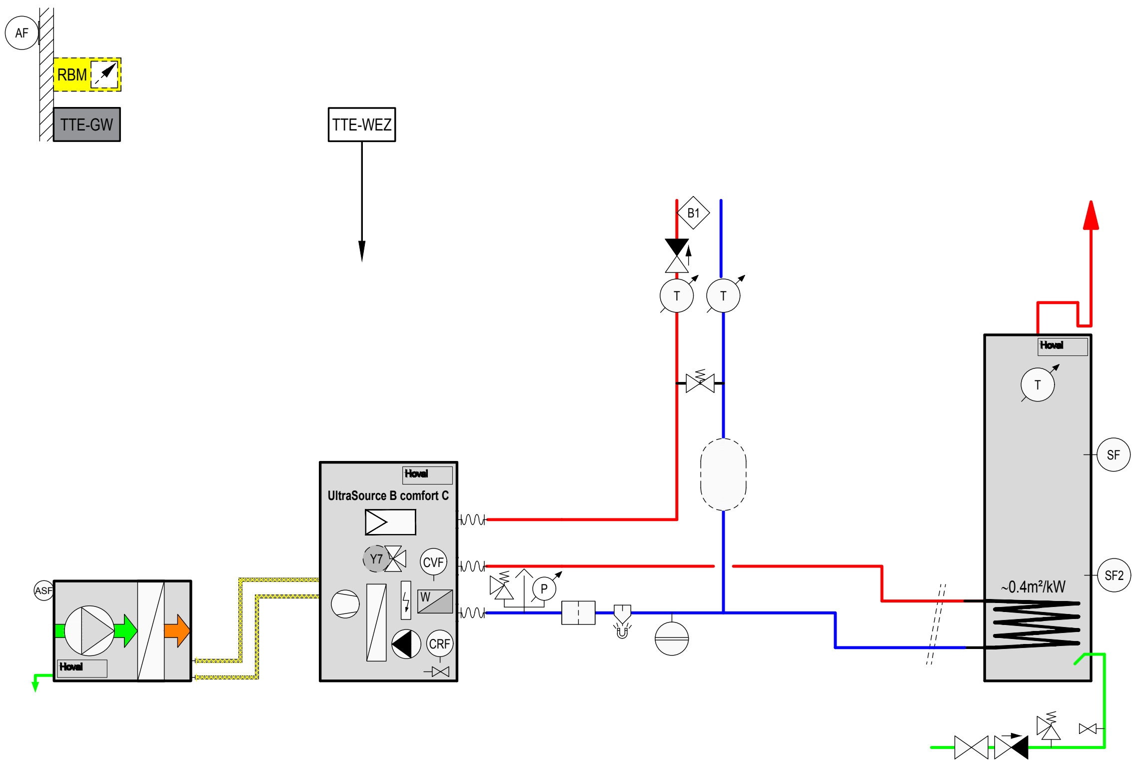
Installation on heating side

- 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 connecting lines.
- To prevent energy losses, the connecting lines must be insulated with suitable material.

UltraSource® B comfort C

Air/water heat pump with
- Calorifier
- 1 direct circuit

Hydraulic schematic BBAKE010



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-H-Gen	TopTronic® E basic module heat generator (installed)
B1	Flow temperature monitor (if required)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
Y7	Switching valve
ASF	Intake sensor
W	Flow sensor (FVT)

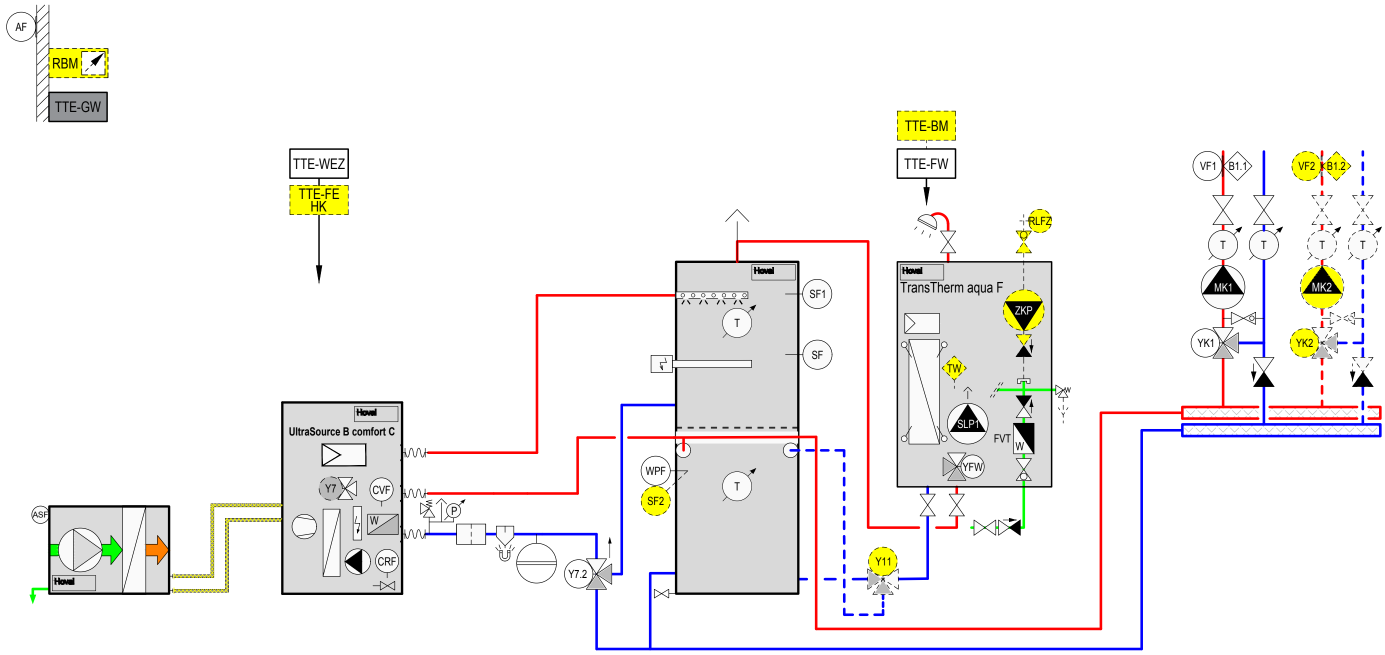
Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

UltraSource® B comfort C

Air/water heat pump with
- Energy buffer storage tank
- TransTherm aqua F fresh water module
- 1-... mixer circuit(s)

Hydraulic schematic BBAKE030



TTE-H-Gen	TopTronic® E basic module heat generator (installed)
TTE-DH	TopTronic® E basic module district heating/fresh water
VF1	Flow temperature sensor 1
B1.1	Flow temperature monitor (if required)
MK1	Pump, mixer circuit 1
YK1	Actuator, mixer 1
AF	Outdoor sensor
SF1	Calorifier sensor 1 (WEZ OFF)
SF1.1	Calorifier sensor 1.1 (TransTherm)
SF2.1	Calorifier sensor 2.1 (TransTherm)
WPF	Heat pump buffer sensor
Y7	Switching valve
Y7.2	Switching valve 2
ASF	Intake sensor
SLP1	Calorifier charging pump
W	Flow sensor (FVT)
Option	
TTE-BM	TopTronic® E control module
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
RLFZ	Circulation sensor
SF2	Calorifier sensor 2 (WEZ ON)
Y11	Return switch actuator
ZKP	Recirculation pump
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature monitor (if required)
MC2	Pump, mixer circuit 2
YK2	Actuator, mixer 2

Important notices
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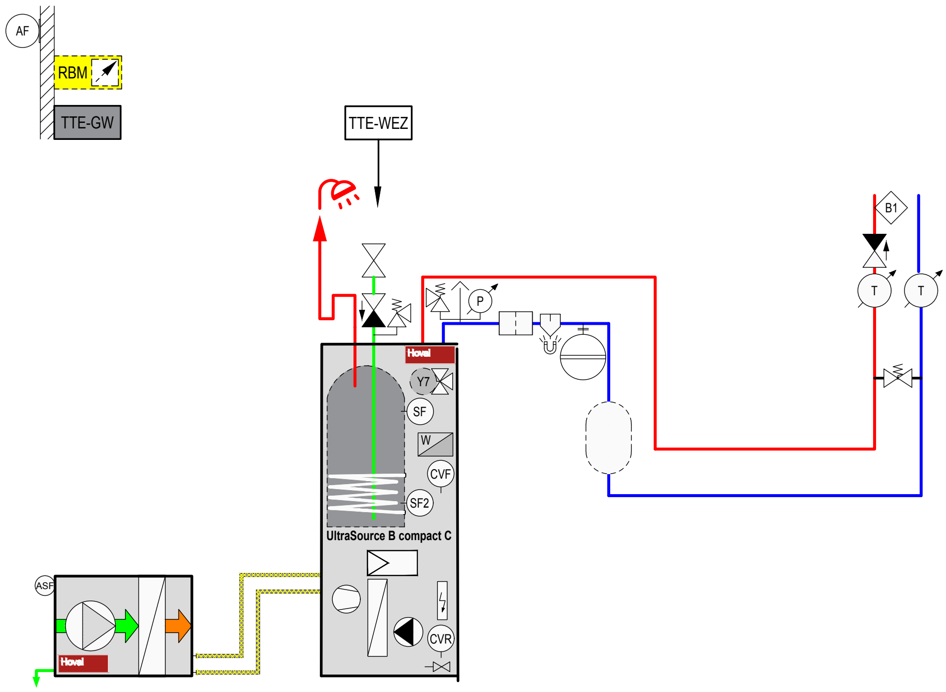
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

UltraSource® B compact C

Air/water heat pump with
- Integrated calorifier
- 1 direct circuit

Hydraulic schematic BBAIE010



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-H-Gen	TopTronic® E basic module heat generator (installed)
B1	Flow temperature monitor (if required)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
Y7	Switching valve
ASF	Intake sensor
W	Flow sensor (FVT)
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

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/Cu
- 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
- Electrical heater 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

Seal of approval FWS
The Belaria® comfort ICM (13) is certified by the CH certification commission.

The built-in high-efficiency pumps fulfil the Eco-design requirements of 2015 with an EEI of ≤ 0.23.

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	2.7-8.0
(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

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 DHW charging circuit
  - Bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast5 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"

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

Part No.

Air/water heat pump

Energy efficiency class see description

Hoval Belaria® comfort ICM

Modulating air/water heat pump for indoor installation for heating, cooling and heating domestic hot water with built-in Hoval TopTronic® E controller.

Integrated control functions for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 DHW charging circuit
  - Bivalent and cascade management
- Can be optionally expanded with max. 1 module expansion:
  - 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)

Without accessories on the air side.

Delivery
- One-piece design, compact unit wired-up internally ready for connection, supplied fully packaged
- The heat pump can be brought in separately. Separation of the heat pump must be performed by a Hovel specialist.

Belaria® comfort ICM Type	Heat output [1] A2W35 kW	Cooling capacity [1] A35W18 kW	Part No.
(8)	2.1-6.6	2.7-8.0	7015 989
(13)	3.8-12.7	6.9-13.9	7015 990

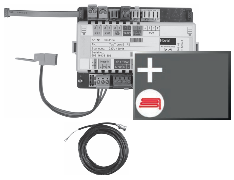
[1] Modulation range

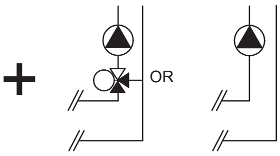
Hose set SH25-32-10-2 — 6044 178
for Belaria® comfort ICM (13)
Consisting of:
flexible connection hoses for
heating side insulated 5/4″
L = 1.0 m, can be shortened on one side

Hose set SH25-25-10-2 — 6046 173
for UltraSource® B comfort (8-17),
Belaria® comfort ICM (8)
Consisting of:
flexible connection hoses for
heating side insulated 1″
L = 1.0 m, can be shortened on one side

Part No.

TopTronic® E module expansions
for TopTronic® E basic module heat generator





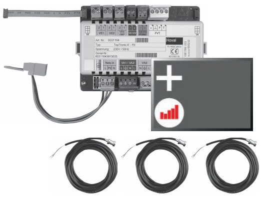
TopTronic® E module expansion heating circuit TTE-FE HK
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

incl. assembly material
1x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

6034 576

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



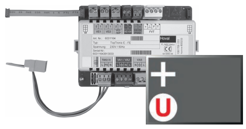
TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:
- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

each incl. energy balancing

incl. assembly material
3x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

incl. assembly material

Can be installed in:
Boiler control, wall housing, control panel

6034 575

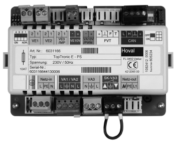
Further information
see “Controls” section - “Hoval TopTronic® E module expansions” chapter

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

Accessories for TopTronic® E

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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

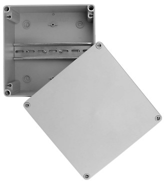
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

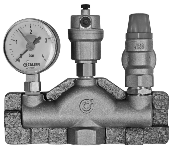
Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Heating accessories

Pressure expansion tanks
see “Various system components”

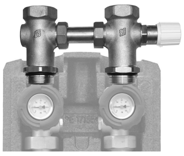


Safety set SG15-1″
Suitable up to max. 50 kW
complete with safety valve (3 bar)
Pressure gauge and automatic air vent
with cut off valve
Connection: 1″ internal thread

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 expansion tank on the side
on connection set
installation option
for an overflow valve
incl. non-return valve

6039 793



Bypass valve DN 32 (1¼″)
for the installation in a HA group DN 32
Setting range 0.6-1.5 bar
Max. flow rate: 1.5 m^3/h
with self-sealing screw connection for
mounting between flow and return
ball valve

6014 849

System water protection filter
Type: 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 loss.
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 Rp1″:
Internal thread with integrated
shut-off valves and union connection
(outlet)
Max. flow rate: ($\Delta p<0.1$ bar): 5.5 m^3/h
Weight: 6.8 kg
Water temperature: max. 90 °C

2076 374

Notice:
Fulfills the function of sludge separator and strainer

Strainers
see “Various system components”

Part No.

Domestic hot water accessories

Warm water set SW25-25-10-1MD
for UltraSource® B comfort C,
UltraSource® T comfort,
Belaria® comfort ICM (8)
Consisting of:
Motor drive for installed
changeover valve
Includes distance wave and flexible
connection hose insulated 1″
L = 1.0 m

6046 181

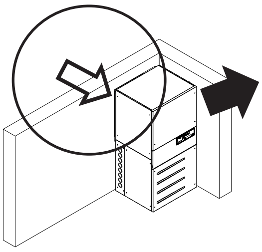
Warm water set SW25-32-10-1MD
for Belaria® comfort ICM (13)
Consisting of:
Motor drive for built-in
changeover valve and flexible
connection hose 5/4″
L = 1.0 m, can be shortened on one side

6044 177

Screw-in electrical heating inset
for plants with buffer storage tank
as emergency heating.

Type	Heat output [kW]	Install. length [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560

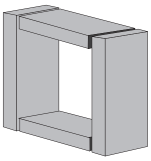
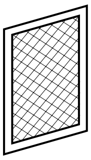
Accessories of the air guide



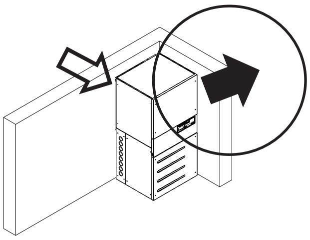
“Standard” indoor installation

Installation directly in the corner

Intake

		Part No.
	**Wall connection element WA-E01** for Belaria® comfort ICM for sealing the suction side directly on the wall black synthetic rubber 50 mm	6031 891
	**“Wall insulation” MI-E01** for Belaria® comfort ICM 4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive	6031 933
	**Weatherproof grille WG-E01** for Belaria® comfort ICM blades for the suction aluminum	6031 935
	**Weatherproof grille WG-E01** **sound-insulated** **for Belaria® comfort ICM** **in aluminium with blades for the suction suitable for masonry insulation and mesh grille**	2076 720
	**Mesh grille MG-E01** for Belaria® comfort ICM	6031 938

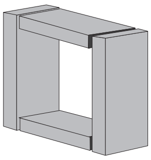
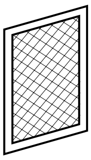
Accessories of the air guide



"Standard" indoor installation

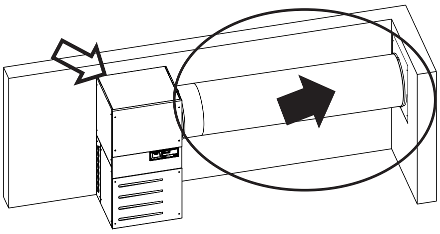
Installation directly in the corner

Outlet

	Part No.
	
Wall connection set WA-A01 for Belaria® comfort ICM consisting of: Wall connection element black synthetic rubber, 50 mm blow-out panel steel, powder-coated	6031 892
	
"Wall insulation" MI-A01 for Belaria® comfort ICM 4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive.	6031 934
	
Weatherproof grille WG-A01 for Belaria® comfort ICM blades for the blow-out aluminum	6031 936
	
Weatherproof grille WG-A01 sound-insulated for Belaria® comfort ICM in aluminium with blades for the blow-out suitable for masonry insulation and mesh grille	2076 721
	
Mesh grille MG-A01 for Belaria® comfort ICM	6031 939

Part No.

Accessories of the air guide



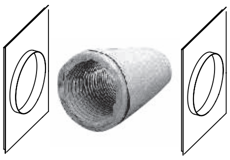
"Flex" indoor installation

"Flex" installation for individual solutions

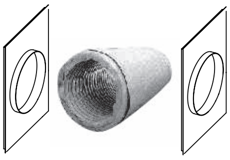
Intake

see "Standard" installation

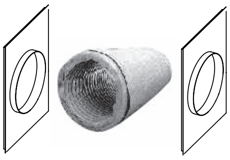
Outlet on side via flexible hose



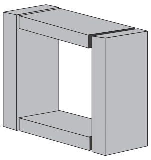
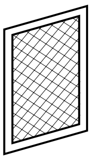
Air hose set LS560-2 for Belaria® comfort ICM length 2 m (can be shortened), Ø 560 mm insulated hose, plastic foil outside. Insulation mineral wool, metal spiral inside with plastic foil. incl. clamps and connection plates; heat pump and wall side.	6032 045



Air hose set LS560-3 for Belaria® comfort ICM length 3 m (can be shortened), 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.	6032 046

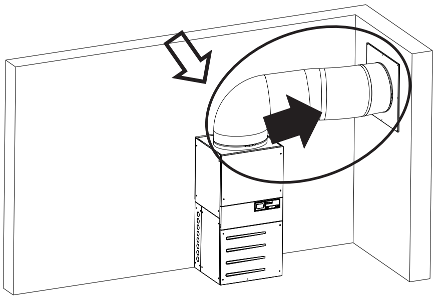


Air hose set LS560-5 for Belaria® comfort ICM length 5 m (can be shortened), Ø 560 mm insulated hose, plastic foil outside. Insulation mineral wool, metal spiral inside with plastic foil. incl. clamps and connection plates; heat pump and wall side.	6032 047

		Part No.
	**“Wall insulation” MI-A02** for Belaria® comfort ICM 4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive.	6032 563
	**Weatherproof grille WG-A02** for Belaria® comfort ICM with blades for blow-out opening with air hose in an air duct. Aluminum	6031 937
	**Weatherproof grille WG-A02 and WG3 sound-insulated** for Belaria® ICM (WG-A02) (blow-out), Belaria® I/IR (15) (WG3) (suction) in aluminium with blades for the blow-out or the suction	2076 722
	**Mesh grille MG-A02** for Belaria® comfort ICM for blow-out opening with air hose in an air duct	6031 940

Part No.

Accessories of the air guide



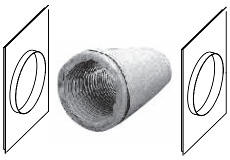
"Flex" indoor installation

"Flex" installation for individual solutions

Intake

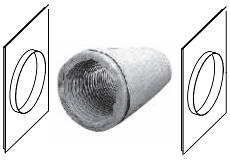
see "Standard" installation

Outlet on top via flexible hose



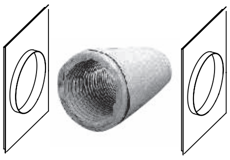
Air hose set LSO 560-2
for Belaria® comfort ICM
Length 2 m (can be shortened), Ø 560 mm
insulated hose, plastic foil outside.
Insulation mineral wool, metal
spiral inside with plastic foil.
incl. clamps, connection plates
and sheet metal cladding for
the heat pump side;
heat pump and wall side.

6046 564



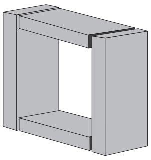
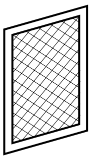
Air hose set LSO 560-3
for Belaria® comfort ICM
Length 3 m (can be shortened), Ø 560 mm
insulated hose, plastic foil outside.
Insulation mineral wool, metal
spiral inside with plastic foil.
incl. clamps, connection plates
and sheet metal cladding for
the heat pump side;
heat pump and wall side.

6046 565



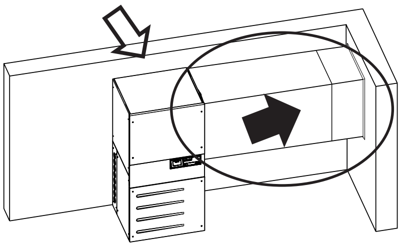
Air hose set LSO 560-5
for Belaria® comfort ICM
Length 5 m (can be shortened), Ø 560 mm
insulated hose, plastic foil outside.
Insulation mineral wool, metal
spiral inside with plastic foil.
incl. clamps, connection plates
and sheet metal cladding for
the heat pump side;
heat pump and wall side.

6046 566

		Part No.
	**“Wall insulation” MI-A02** for Belaria® comfort ICM 4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive.	6032 563
	**Weatherproof grille WG-A02** for Belaria® comfort ICM with blades for blow-out opening with air hose in an air duct. Aluminum	6031 937
	**Weatherproof grille WG-A02 and WG3 sound-insulated** for Belaria® ICM (WG-A02) (blow-out), Belaria® I/IR (15) (WG3) (suction) in aluminium with blades for the blow-out or the suction	2076 722
	**Mesh grille MG-A02** for Belaria® comfort ICM for blow-out opening with air hose in an air duct	6031 940

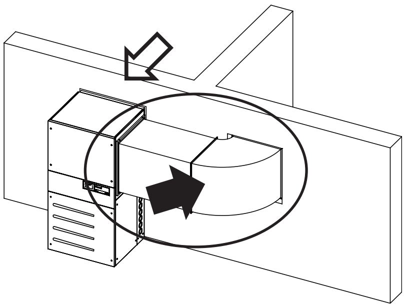
Part No.

Accessories of the air guide



“Duct” indoor installation

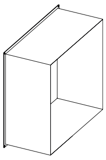
Straight or with elbow



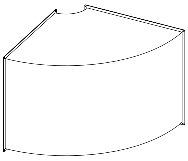
Intake

see “Standard” installation

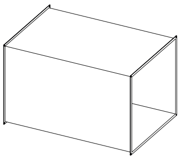
Blow off to the side via duct



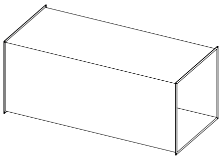
Wall fitting MS01 for Belaria® comfort ICM For connection of the air duct LKG 10 or LKG 15 on the wall air duct wall fitting insulated incl. installation material H x W: 680 x 650 mm	6040 349



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

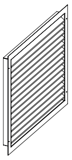
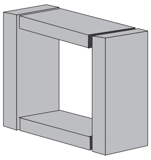
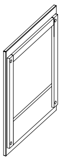


Air duct LKG10 - 1.0 m for Belaria® comfort ICM air duct outlet side insulated, incl. installation material H x W x L: 680 x 650 mm x 1000 mm ducts can be shortened	6040 351



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
	**“Wall insulation” MI-E01** for Belaria® comfort ICM 4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive	6031 933
	**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++
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
• Power consumption A2W35	kW	0.9	1.7
• Coefficient of performance A2W35	COP	4.3	4.1
• Nominal heat output A7W35	kW	4.5	8.3
• Power consumption A7W35	kW	0.9	1.7
• Coefficient of performance A7W35	COP	5.1	4.8
• Nominal heat output A-7W35	kW	2.8	5.5
• Power consumption A-7W35	kW	0.9	1.7
• 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
• Power consumption A35W18	kW	1.1	2.3
• Coefficient of performance A35W18	EER	4.5	4.1
• Nominal heat output A35W7	kW	3.4	6.8
• Power consumption A35W7	kW	1.1	2.2
• Coefficient of performance A35W7	EER	3.2	3.0
Sound data			
• Sound power level EN 12102 outdoor 1)	dB (A)	44	51
• Sound pressure level at 5 m	dB (A)	25	30
• Sound pressure level at 10 m	dB (A)	19	24
• Sound power level EN 12102 indoor	dB (A)	44	42
Hydraulic data			
• Max. flow temperature	°C	62	60
• Max. flow of heating water with A7/W35, 5K 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	1.9

Type		**(8)**	**(13)**
Electrical data			
• Electrical connection compressor	V / Hz	1~230/50	3~400/50
• Electrical connection immersion heater	V / Hz	3~400/50	3~400/50
• Control electrical connection	V / Hz	opt. 1~230/50 1~230/50	1~230/50
• Max. compressor operating current	A	15.3	19.7
• Max. immersion heater operating current	A	13	13
• Max. fan operating current	A	0.24	0.5
• Max. fan power consumption	W	56	115
• Max. compressor starting current	A	15.3	19.7
• Main current fuse	A	C 16	C 20
• Control current fuse	A	B 13	B 13
• Immersion heater fuse	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

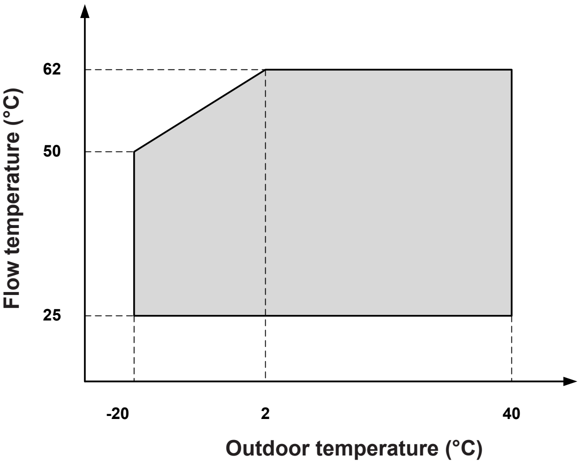
[1] The sound power levels apply in whisper mode. Values increase by +4 dB(A) in normal operation.

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

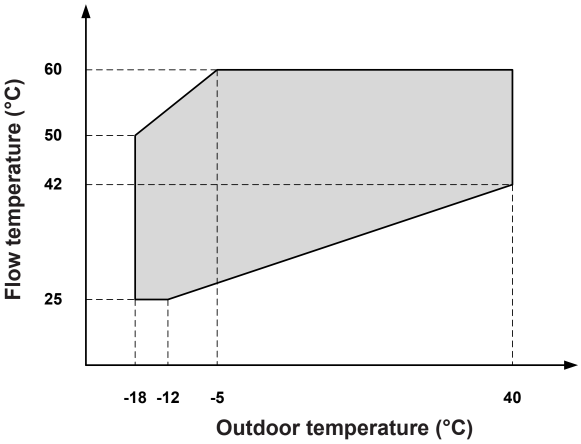
Graphs of operating range

Heating and how water

Belaria® comfort ICM (8)

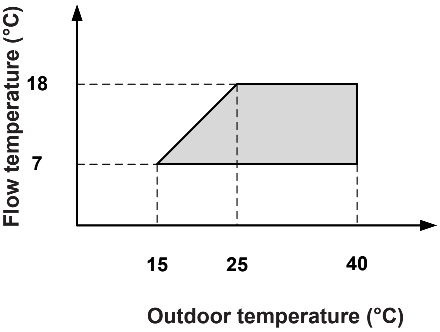


Belaria® comfort ICM (13)

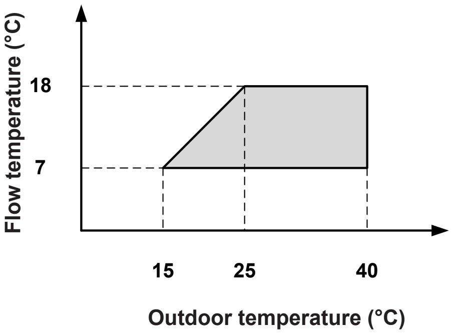


Cooling

Belaria® comfort ICM (8)



Belaria® comfort ICM (13)



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.

Indoor unit
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.

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)

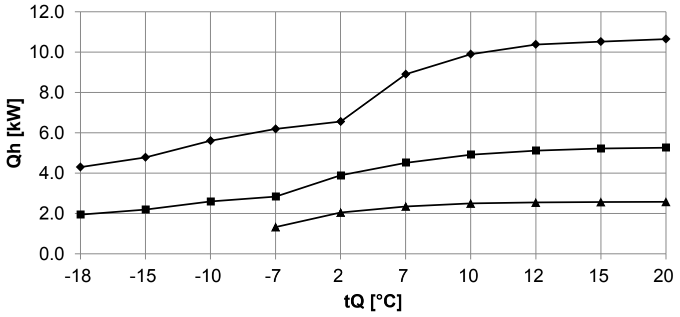
Structure-borne sound
To prevent the transmission of structure-borne sound, all connections must be fitted with compensators or vibration dampers.

Performance data – heating

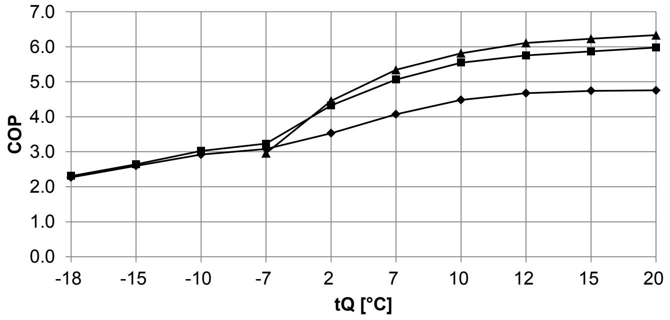
Maximum heat output allowing for defrosting losses

Belaria® comfort ICM (8)

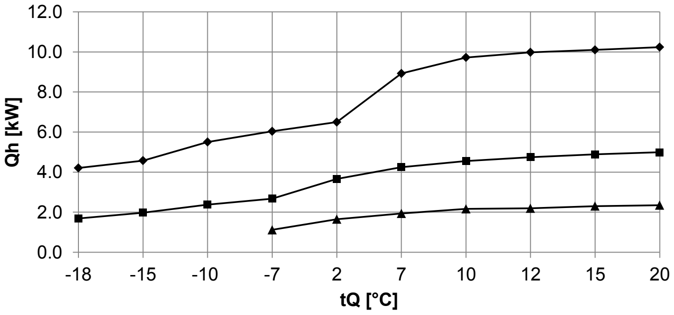
Heat output - t_{FL} 35 °C



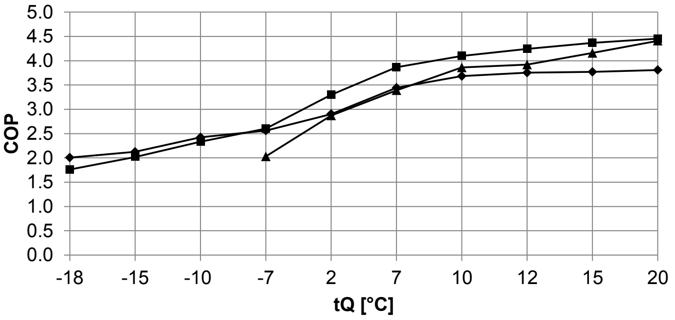
Coefficient of performance - t_{FL} 35 °C



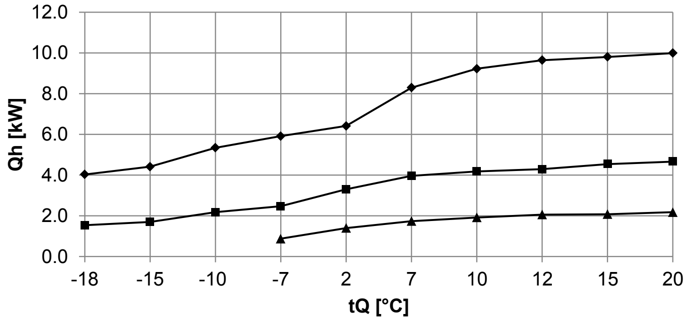
Heat output - t_{FL} 45 °C



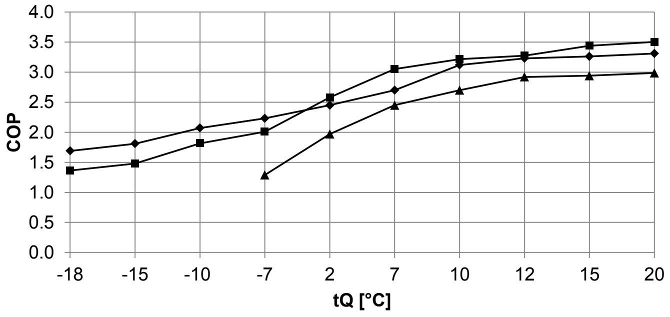
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 55 °C



Coefficient of performance - t_{FL} 55 °C



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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

Belaria® comfort ICM (8)

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-18	4.30	1.84	2.27	1.94	0.84	2.31	-	-	-
	-15	4.78	1.84	2.60	2.19	0.83	2.64	-	-	-
	-10	5.61	1.92	2.92	2.60	0.86	3.02	-	-	-
	-7	6.19	1.92	3.08	2.84	0.86	3.23	1.33	0.47	2.96
	2	6.56	1.87	3.53	3.89	0.90	4.32	2.05	0.46	4.46
	7	8.91	2.10	4.07	4.51	0.87	5.06	2.35	0.44	5.34
	10	9.90	2.21	4.48	4.91	0.89	5.55	2.50	0.43	5.81
	12	10.38	2.22	4.68	5.12	0.89	5.75	2.55	0.44	6.11
	15	10.52	2.24	4.74	5.22	0.89	5.87	2.57	0.43	6.23
	20	10.65	2.24	4.75	5.26	0.88	5.98	2.58	0.43	6.33
45	-18	4.21	2.10	2.00	1.69	0.96	1.76	-	-	-
	-15	4.57	2.15	2.13	1.98	0.98	2.02	-	-	-
	-10	5.50	2.27	2.42	2.38	1.02	2.33	-	-	-
	-7	6.04	2.36	2.56	2.68	1.03	2.60	1.12	0.57	2.03
	2	6.50	2.24	2.90	3.66	1.11	3.30	1.65	0.58	2.87
	7	8.92	2.59	3.44	4.25	1.10	3.86	1.94	0.57	3.39
	10	9.72	2.64	3.68	4.55	1.11	4.10	2.17	0.58	3.86
	12	9.98	2.66	3.75	4.75	1.12	4.24	2.20	0.56	3.92
	15	10.10	2.68	3.77	4.89	1.12	4.37	2.30	0.58	4.16
	20	10.24	2.69	3.81	4.99	1.12	4.46	2.35	0.57	4.41
50	-18	3.37	2.28	1.48	1.52	1.04	1.49	-	-	-
	-15	3.89	2.37	1.64	1.78	1.07	1.66	-	-	-
	-10	4.88	2.52	1.93	2.26	1.13	2.04	-	-	-
	-7	5.58	2.53	2.21	2.56	1.13	2.26	1.20	0.62	1.94
	2	5.90	2.44	2.42	3.50	1.17	2.90	1.84	0.60	3.07
	7	7.92	2.86	2.77	4.01	1.19	3.26	2.09	0.60	3.48
	10	8.67	2.97	2.92	4.30	1.19	3.48	2.19	0.58	3.79
	12	8.98	2.96	3.03	4.43	1.19	3.63	2.21	0.59	3.76
	15	9.43	3.02	3.12	4.68	1.20	3.90	2.30	0.58	3.97
	20	9.72	3.01	3.23	4.80	1.18	4.06	2.35	0.58	4.08
55	-18	4.03	2.39	1.69	1.54	1.13	1.36	-	-	-
	-15	4.41	2.45	1.81	1.70	1.15	1.48	-	-	-
	-10	5.34	2.59	2.07	2.18	1.20	1.82	-	-	-
	-7	5.91	2.66	2.23	2.47	1.23	2.01	0.88	0.69	1.29
	2	6.41	2.63	2.45	3.30	1.28	2.58	1.40	0.72	1.97
	7	8.29	3.07	2.70	3.96	1.27	3.05	1.74	0.72	2.45
	10	9.22	2.97	3.12	4.18	1.30	3.22	1.92	0.72	2.70
	12	9.64	3.00	3.23	4.29	1.31	3.27	2.06	0.72	2.92
	15	9.80	3.01	3.26	4.54	1.32	3.44	2.08	0.72	2.94
	20	9.99	3.03	3.31	4.66	1.33	3.50	2.18	0.73	2.99
60	-7	5.19	2.57	2.02	2.24	1.35	1.66	-	-	-
	2	5.63	2.54	2.22	3.10	1.44	2.15	1.32	0.81	1.62
	7	7.28	2.97	2.45	3.64	1.45	2.51	1.60	0.82	1.95
	10	8.10	2.87	2.82	3.95	1.43	2.76	1.81	0.79	2.29
	12	8.47	2.90	2.92	4.15	1.44	2.88	1.99	0.79	2.52
	15	8.60	2.89	2.98	4.36	1.44	3.03	2.00	0.79	2.54
	20	8.79	2.91	3.02	4.47	1.44	3.10	2.09	0.79	2.65

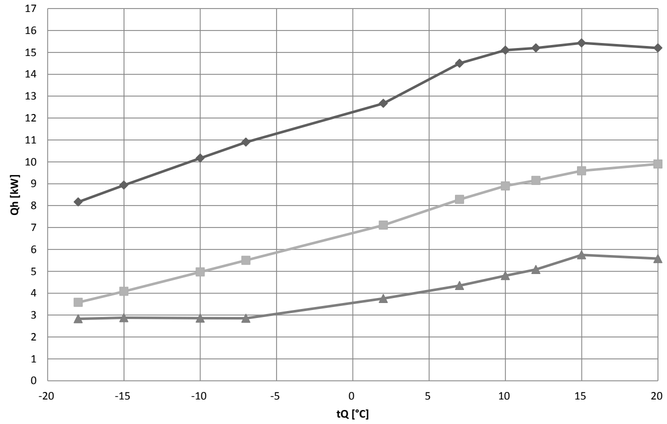
tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = Heat output (kW), measured in accordance with standard EN 14511
P = Power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

Performance data – heating

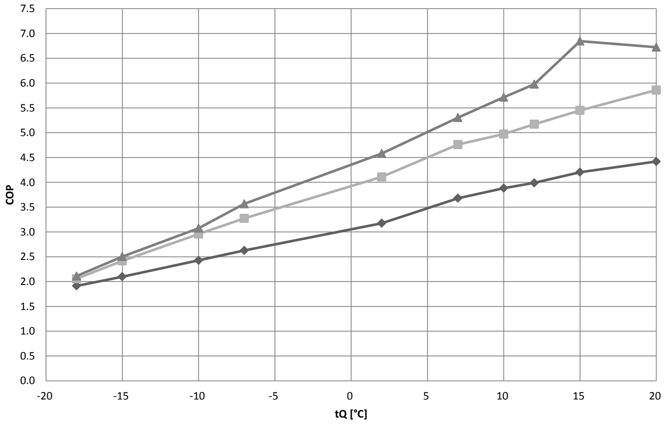
Maximum heat output allowing for defrosting losses

Belaria® comfort ICM (13)

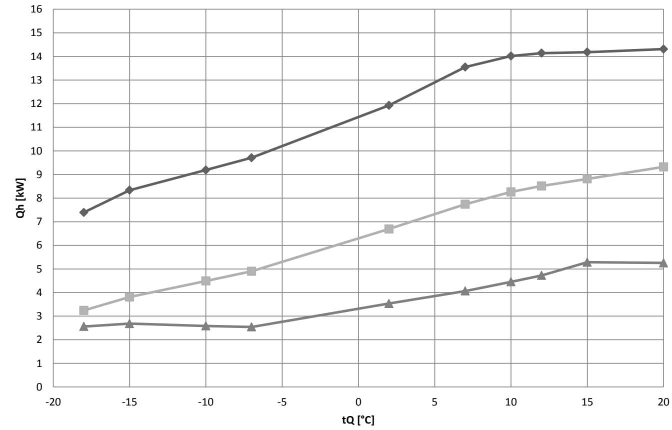
Heat output - t_{FL} 35 °C



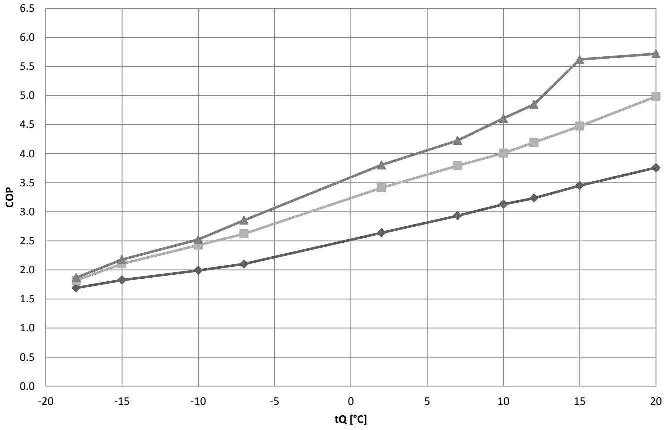
Coefficient of performance - t_{FL} 35 °C



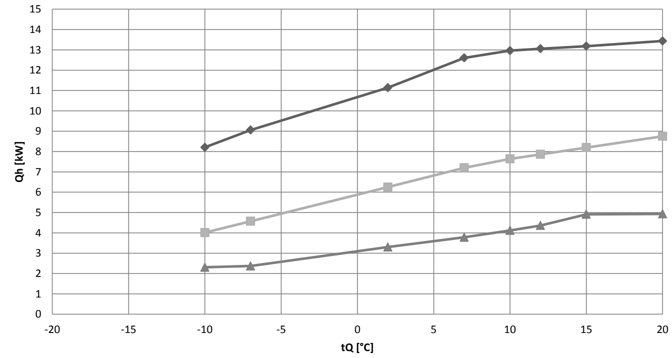
Heat output - t_{FL} 45 °C



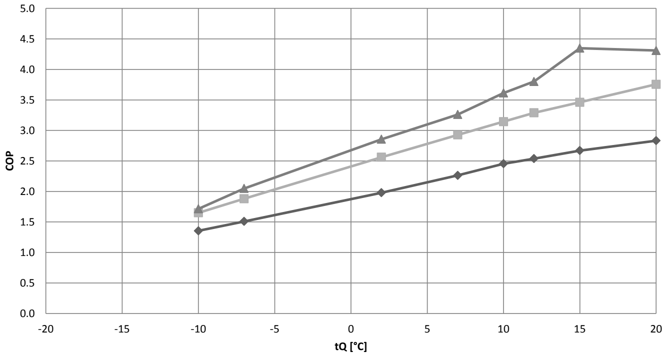
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 55 °C



Coefficient of performance - t_{FL} 55 °C



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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

Belaria® comfort ICM (13)

Data according to EN 14511

tFL °C	tQ °C	Maximum output			Nominal output			Minimum output		
		Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-18	8.2	4.3	1.9	3.6	1.7	2.1	2.8	1.3	2.1
	-15	8.9	4.3	2.1	4.1	1.7	2.4	2.9	1.2	2.5
	-10	10.2	4.2	2.4	5.0	1.7	3.0	2.9	0.9	3.1
	-7	10.9	4.2	2.6	5.5	1.7	3.3	2.9	0.8	3.6
	2	12.7	4.0	3.2	7.1	1.7	4.1	3.8	0.8	4.6
	7	14.5	3.9	3.7	8.3	1.7	4.8	4.4	0.8	5.3
	10	15.1	3.9	3.9	8.9	1.8	5.0	4.8	0.8	5.7
	12	15.2	3.8	4.0	9.2	1.8	5.2	5.1	0.9	6.0
	15	15.4	3.7	4.2	9.6	1.8	5.5	5.8	0.8	6.9
	20	15.2	3.4	4.4	9.9	1.7	5.9	5.6	0.8	6.7
45	-18	7.4	4.4	1.7	3.2	1.8	1.8	2.6	1.4	1.9
	-15	8.3	4.6	1.8	3.8	1.8	2.1	2.7	1.2	2.2
	-10	9.2	4.6	2.0	4.5	1.9	2.4	2.6	1.0	2.5
	-7	9.7	4.6	2.1	4.9	1.9	2.6	2.5	0.9	2.9
	2	11.9	4.5	2.6	6.7	2.0	3.4	3.5	0.9	3.8
	7	13.6	4.6	2.9	7.7	2.0	3.8	4.1	1.0	4.2
	10	14.0	4.5	3.1	8.3	2.1	4.0	4.5	1.0	4.6
	12	14.1	4.4	3.2	8.5	2.0	4.2	4.7	1.0	4.9
	15	14.2	4.1	3.5	8.8	2.0	4.5	5.3	0.9	5.6
	20	14.3	3.8	3.8	9.3	1.9	5.0	5.3	0.9	5.7
55	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	8.2	6.1	1.4	4.0	2.4	1.7	2.3	1.4	1.7
	-7	9.1	6.0	1.5	4.7	2.4	2.0	2.4	1.2	2.1
	2	11.1	5.6	2.0	6.3	2.4	2.6	3.3	1.2	2.9
	7	12.6	5.6	2.3	7.2	2.5	2.9	3.8	1.2	3.3
	10	13.0	5.3	2.5	7.6	2.4	3.1	4.1	1.1	3.6
	12	13.1	5.1	2.5	7.9	2.4	3.3	4.4	1.2	3.8
	15	13.2	4.9	2.7	8.2	2.4	3.5	4.9	1.1	4.4
	20	13.4	4.7	2.8	8.8	2.3	3.8	4.9	1.1	4.3
60	-18	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	-	-	-	-	-	-	-	-	-
	2	10.6	6.2	1.7	6.0	2.7	2.2	3.2	1.3	2.5
	7	11.9	6.1	2.0	6.8	2.7	2.5	3.6	1.3	2.8
	10	12.4	5.9	2.1	7.3	2.7	2.7	3.9	1.3	3.1
	12	12.5	5.7	2.2	7.6	2.7	2.8	4.2	1.3	3.3
	15	12.7	5.5	2.3	7.9	2.7	3.0	4.7	1.3	3.8
	20	13.1	5.3	2.5	8.5	2.6	3.3	4.8	1.3	3.7

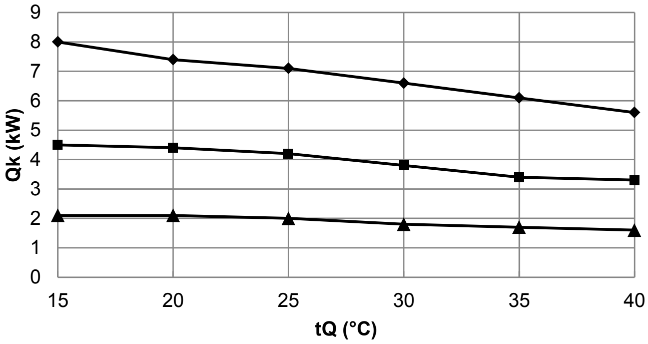
tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = Heat output (kW), measured in accordance with standard EN 14511
P = Power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

Performance data – cooling

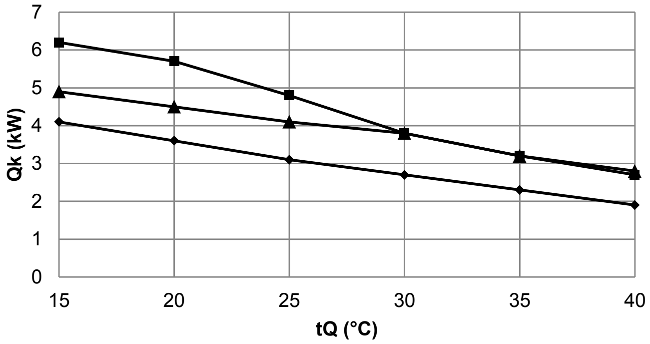
Maximum cooling capacity

Belaria® comfort ICM (8)

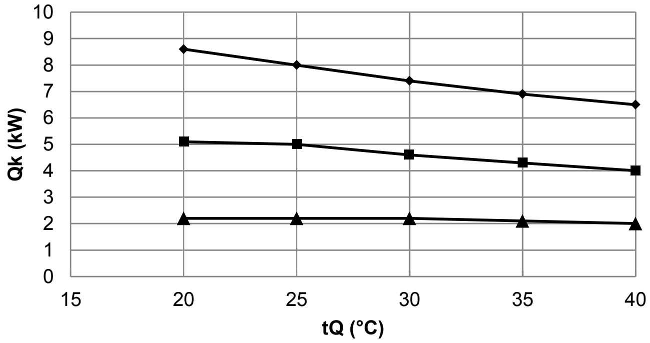
Cooling capacity - t_{FL} 7 °C



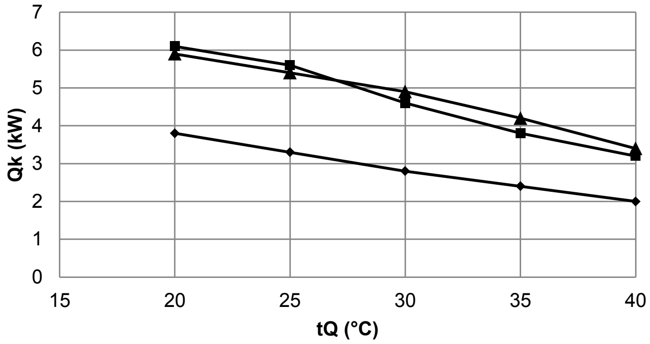
Coefficient of performance - t_{FL} 7 °C



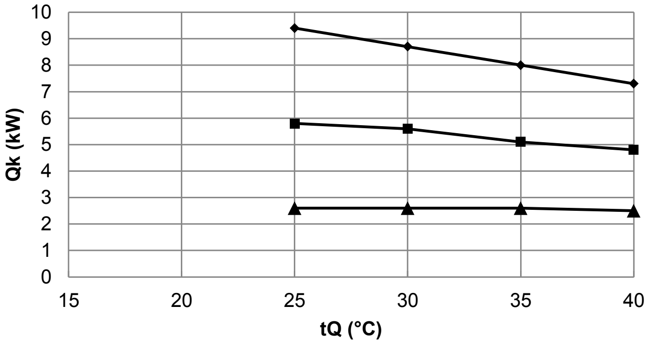
Cooling capacity - t_{FL} 12 °C



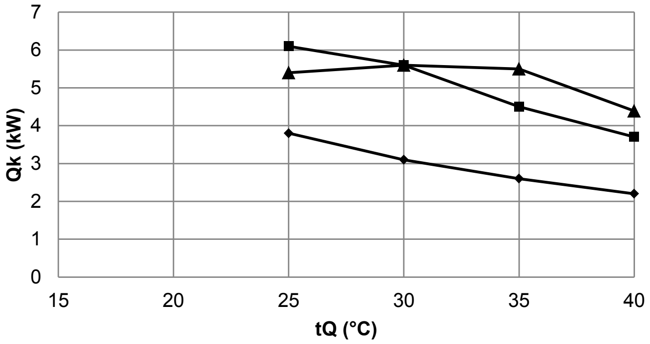
Coefficient of performance - t_{FL} 12 °C



Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

—◆— Maximum output
—■— Nominal output
—▲— Minimum output

Performance data – cooling

Belaria® comfort ICM (8)

Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	**tQ °C**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**
7	20	7.4	2.1	3.6	4.4	0.8	5.7	2.1	0.5	4.5
	25	7.1	2.3	3.1	4.2	0.9	4.8	2	0.5	4.1
	30	6.6	2.5	2.7	3.8	1	3.8	1.8	0.5	3.8
	35	6.1	2.7	2.3	3.4	1.1	3.2	1.7	0.5	3.2
	40	5.6	2.9	1.9	3.3	1.2	2.7	1.6	0.6	2.8
12	15	-	-	-	-	-	-	-	-	-
	20	8.6	2.3	3.8	5.1	0.8	6.1	2.2	0.8	5.9
	25	8	2.4	3.3	5	0.9	5.6	2.2	0.9	5.4
	30	7.4	2.6	2.8	4.6	1	4.6	2.2	1	4.9
	35	6.9	2.9	2.4	4.3	1.1	3.8	2.1	1.1	4.2
	40	6.5	6.2	2	4	1.3	3.2	2	1.2	3.4
18	15	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-
	25	9.4	2.5	3.8	5.8	0.9	6.1	2.6	0.5	5.4
	30	8.7	2.9	3.1	5.6	1	5.6	2.6	0.5	5.6
	35	8	3.1	2.6	5.1	1.1	4.5	2.6	0.5	5.5
	40	7.3	3.4	2.2	4.8	1.3	3.7	2.5	0.6	4.39

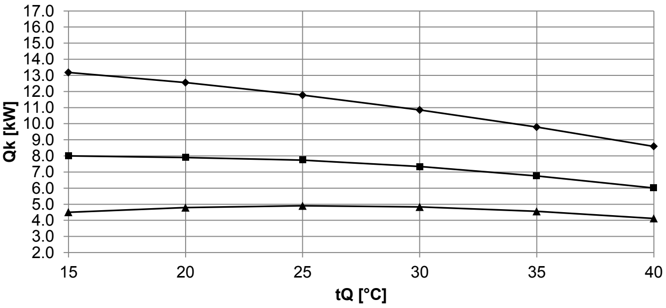
tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

Performance data – cooling

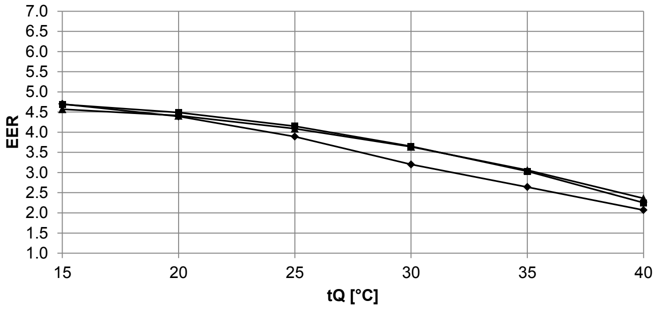
Maximum cooling capacity

Belaria® comfort ICM (13)

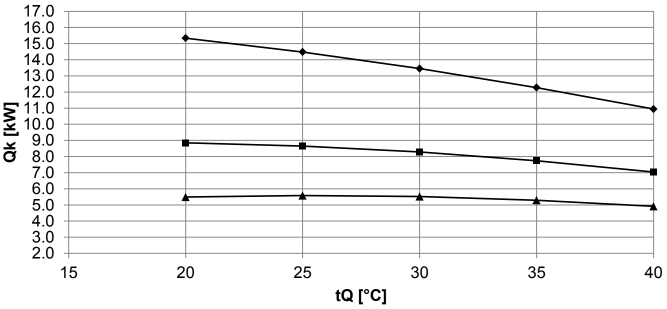
Cooling capacity - t_{FL} 7 °C



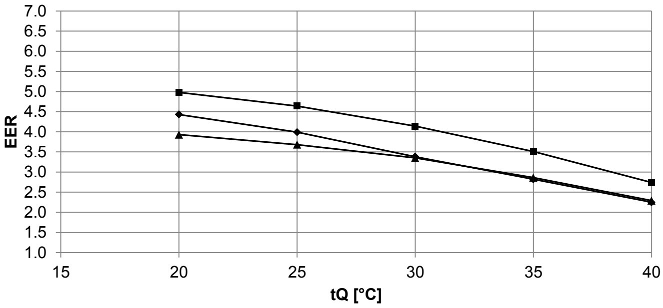
Coefficient of performance - t_{FL} 7 °C



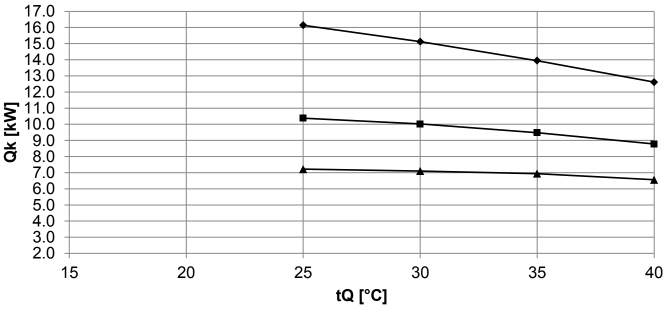
Cooling capacity - t_{FL} 12 °C



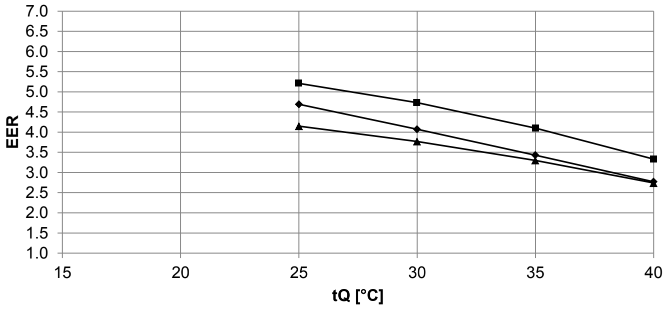
Coefficient of performance - t_{FL} 12 °C



Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

◆ Maximum output
■ Nominal output
▲ Minimum output

Performance data – cooling

Belaria® comfort ICM (13)

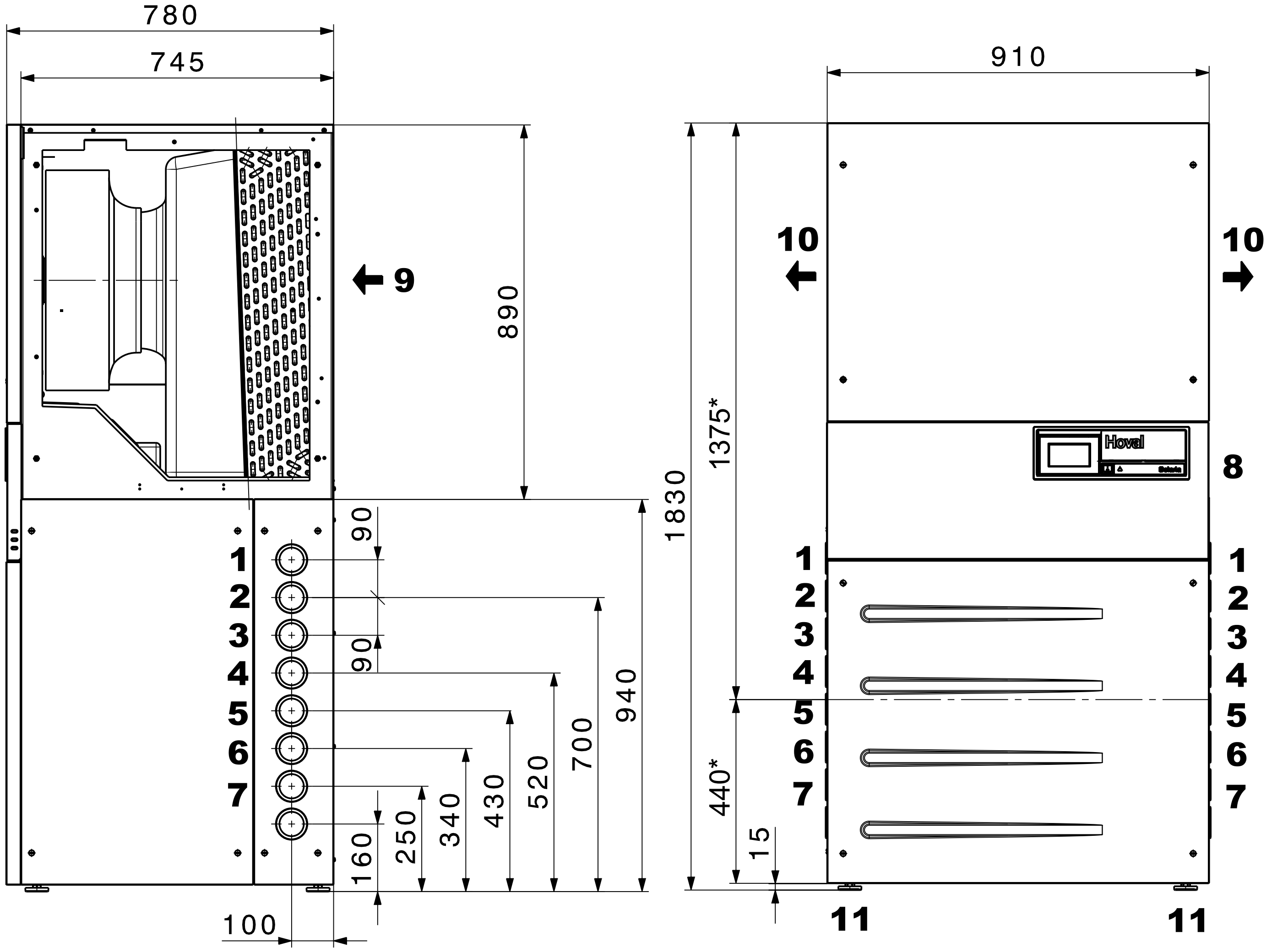
Data according to EN 14511

		Maximum output			Nominal output			Minimum output		
tFL °C	**tQ °C**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**
7	15	13.2	2.8	4.7	8.0	1.7	4.7	4.5	1.0	4.6
	20	12.6	2.9	4.4	7.9	1.8	4.5	4.8	1.1	4.4
	25	11.8	3.0	3.9	7.7	1.9	4.2	4.9	1.2	4.1
	30	10.9	3.4	3.2	7.3	2.0	3.7	4.8	1.3	3.6
	35	9.8	3.7	2.6	6.8	2.2	3.0	4.6	1.5	3.1
	40	8.6	4.2	2.1	6.0	2.7	2.3	4.1	1.7	2.4
12	15	-	-	-	-	-	-	-	-	-
	20	15.3	3.5	4.4	8.9	1.8	5.0	5.5	1.4	3.9
	25	14.5	3.6	4.0	8.7	1.9	4.6	5.6	1.5	3.7
	30	13.5	4.0	3.4	8.3	2.0	4.1	5.5	1.7	3.4
	35	12.3	4.4	2.8	7.7	2.2	3.5	5.3	1.9	2.9
	40	10.9	4.9	2.3	7.0	2.6	2.7	4.9	2.1	2.3
18	15	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-
	25	16.1	3.5	4.7	10.4	2.0	5.2	7.2	1.7	4.2
	30	15.1	3.7	4.1	10.0	2.1	4.7	7.1	1.9	3.8
	35	13.9	4.1	3.4	9.5	2.3	4.1	6.9	2.1	3.3
	40	12.6	4.6	2.8	8.8	2.6	3.3	6.6	2.4	2.7

tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = 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 = Coefficient of performance for the overall unit in accordance with standard EN 14511

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
11 Adjustable feet

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

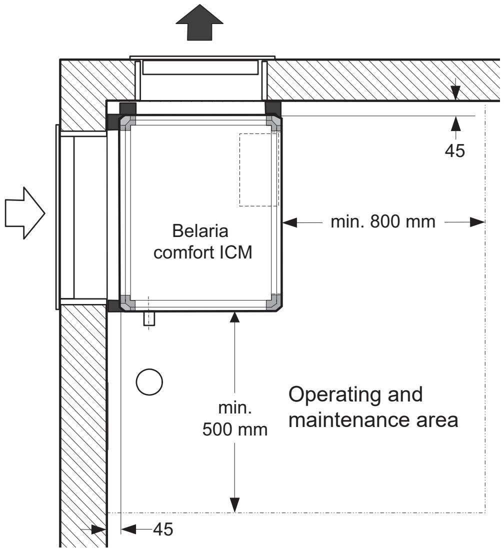
Space requirement “standard” installation with wall insulation MI

“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.

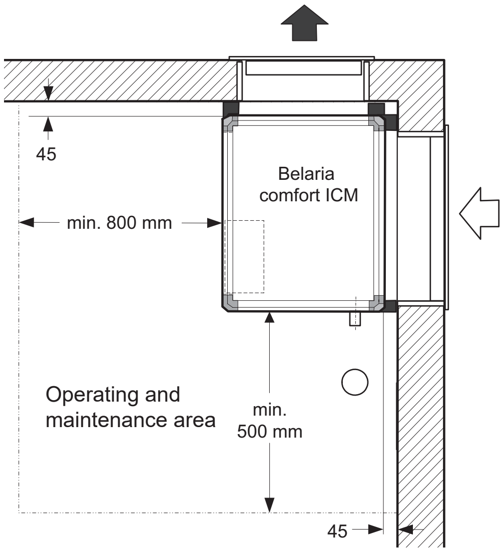
Cut-outs
The cut-outs must be created professionally and without cold bridges! The dimensions of the cut-outs are “clear dimensions” measured from the finished floor!

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.

Outlet right

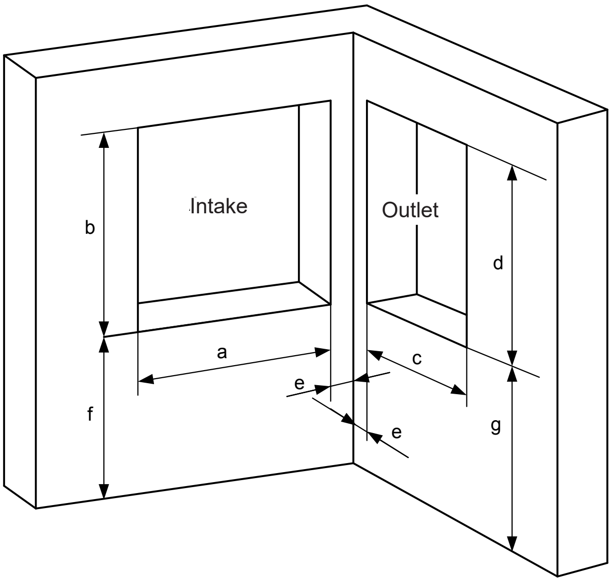


Outlet left

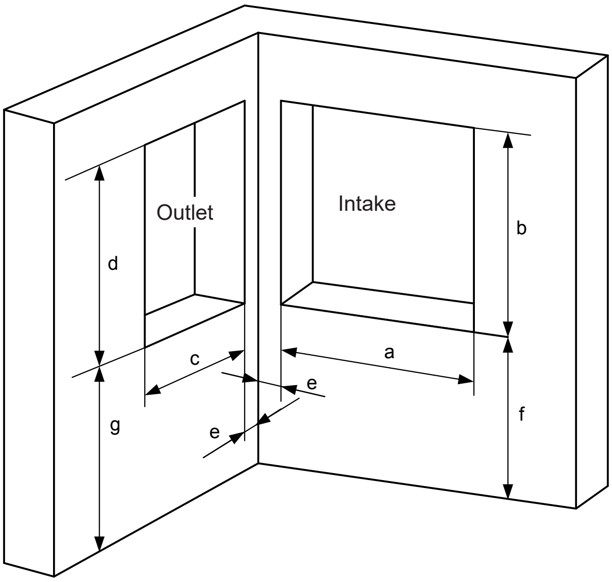


Cut-out dimensions
“Standard” installations - heat pump in the corner, without air ducts, with wall insulation MI
(Dimensions in mm)
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of finished floor.

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



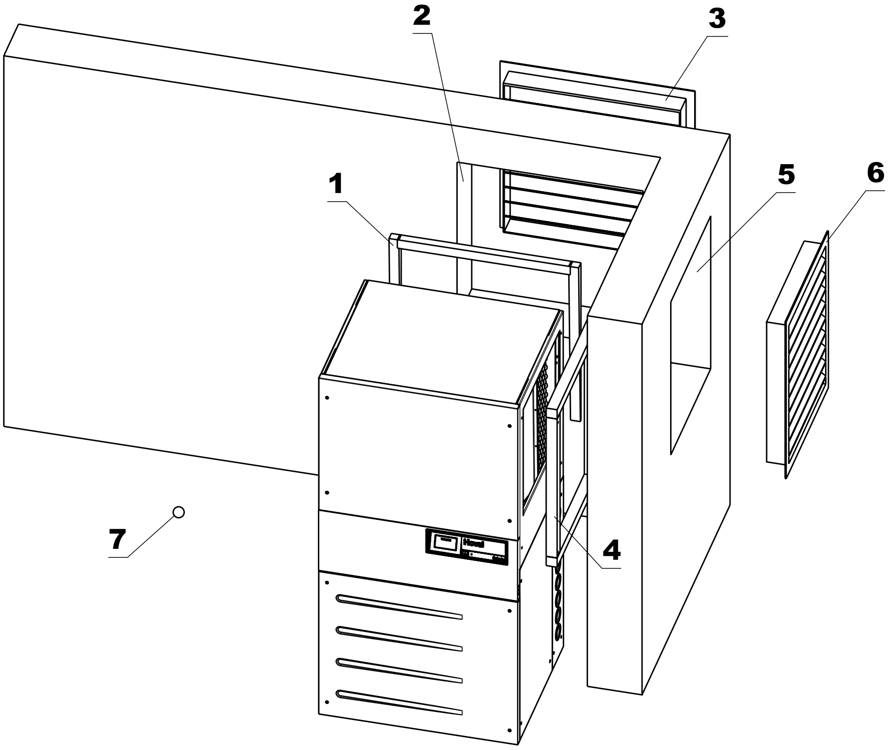
Standard installation 2
Air outlet to the left



Cut-out dimensions

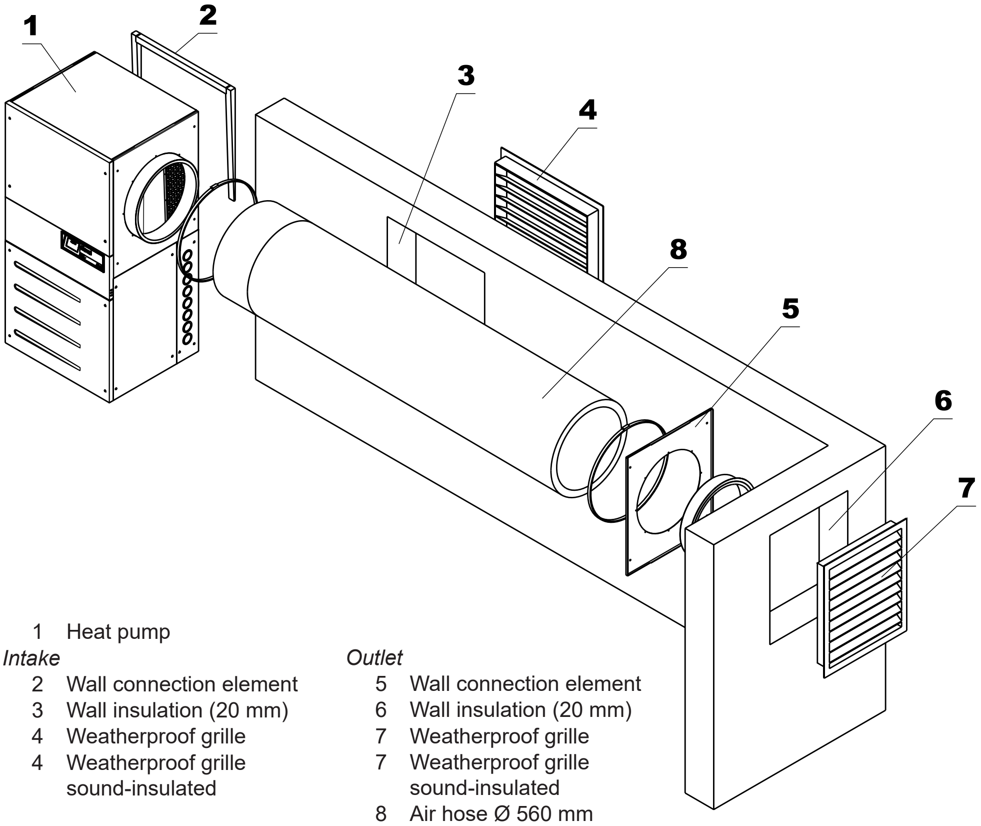
Belaria® comfort ICM	a	b	c	d	e	f	g
(8,13)	850	835	680	785	80	960	970

Space requirement “standard” installation with wall insulation MI



Belaria® comfort ICM		Application	Accessories Type	Part No.
Heat pump		Indoor installation		
1	Wall connection element	Intake	WA-E01	6031 891
2	Wall insulation	Intake	MI-E01	6031 933
3	Weatherproof grille	Intake	WG-E01	6031 935
3	Weatherproof grille sound-insulated	Intake	WG-E01	2076 720
4	Wall connection set	Outlet	WA-A01	6031 892
5	Wall insulation	Outlet	MI-A01	6031 934
6	Weatherproof grille	Outlet	WG-A01	6031 936
6	Weatherproof grille sound-insulated	Outlet	WG-A01	2076 721
7	Condensate drain			

Space requirement "Flex" installation with wall insulation MI



1 Heat pump

Intake

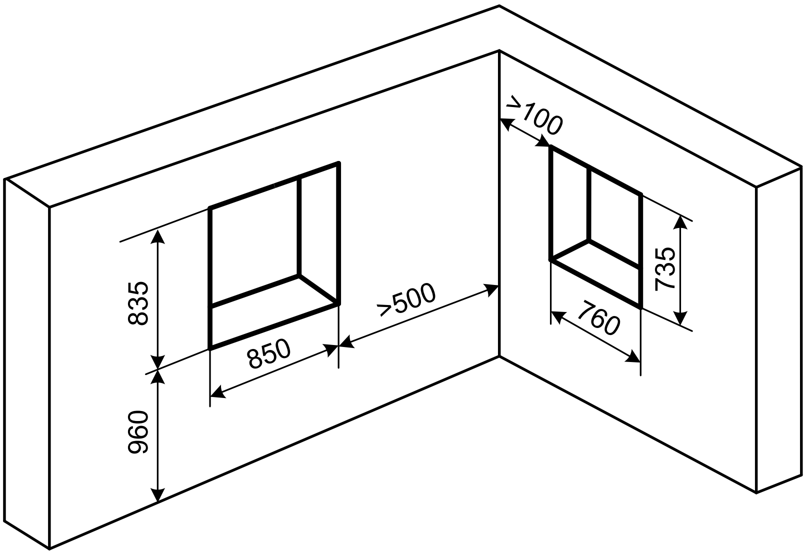
2 Wall connection element
3 Wall insulation (20 mm)
4 Weatherproof grille
4 Weatherproof grille sound-insulated

Outlet

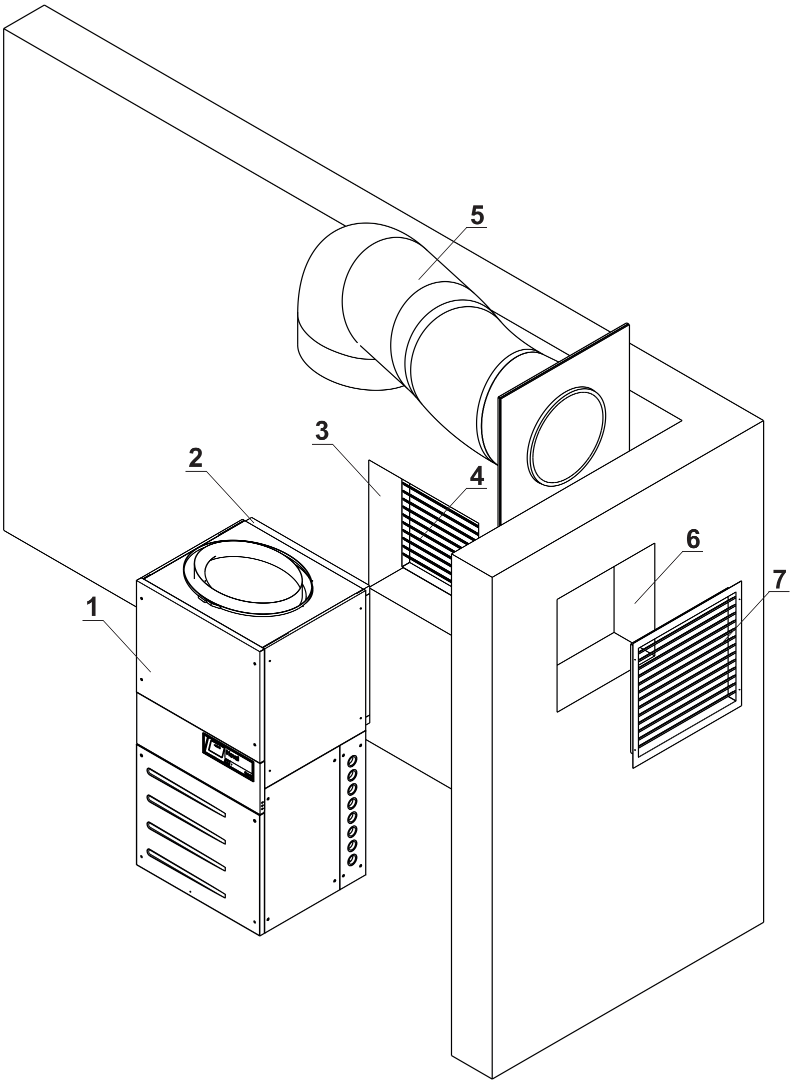
5 Wall connection element
6 Wall insulation (20 mm)
7 Weatherproof grille
7 Weatherproof grille sound-insulated
8 Air hose Ø 560 mm

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.

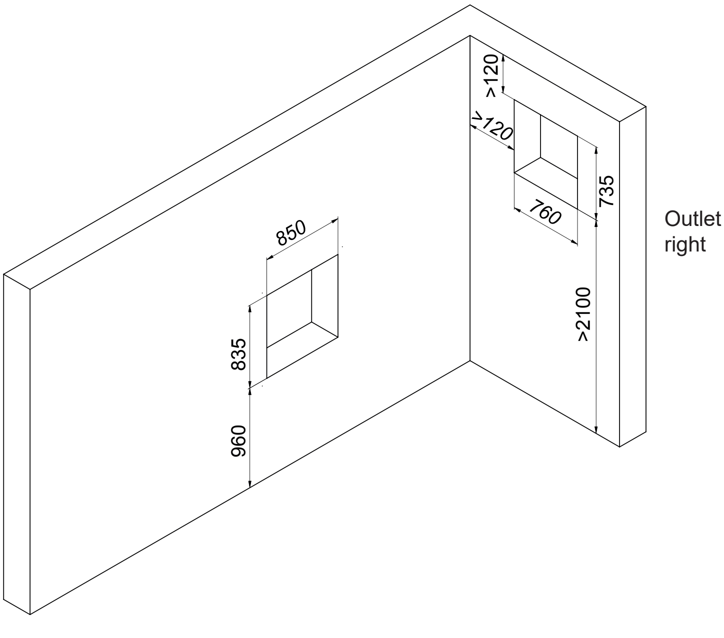


Space requirement “Flex” installation with wall insulation MI, outlet on top via flexible hose

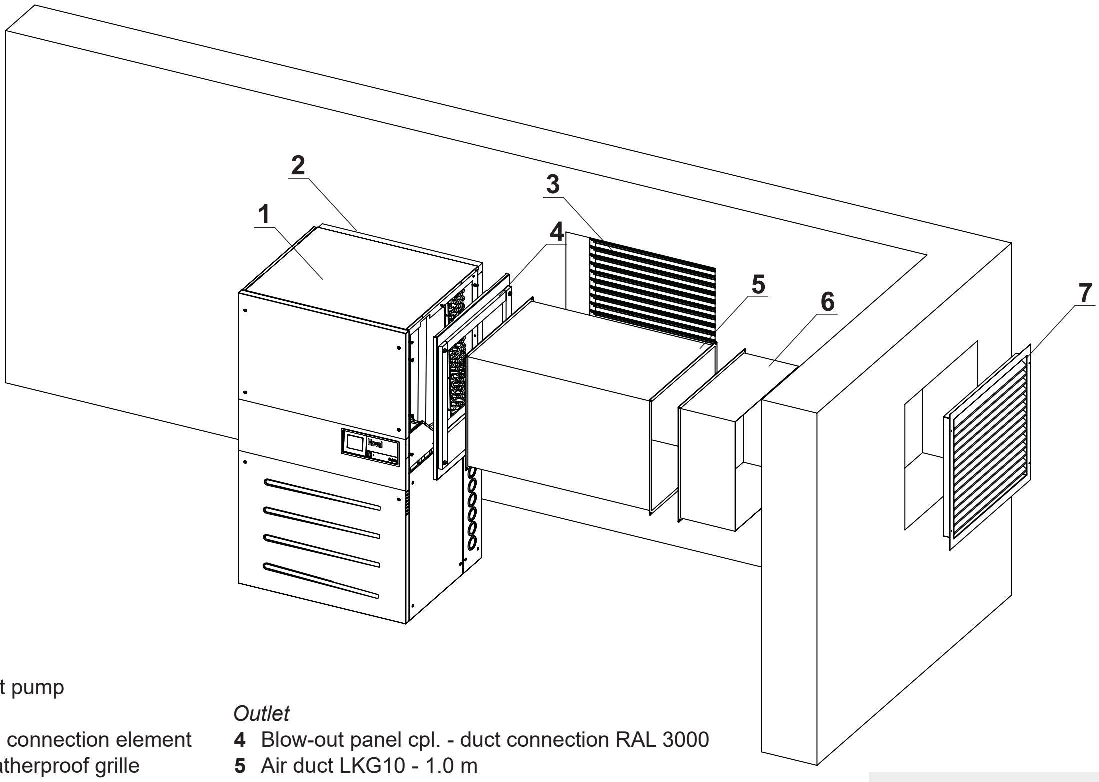


1	Heat pump	Intake	
2	Wall connection element	Intake	WA-E01
3	Wall insulation (20 mm)	Intake	MI-E01
4	Weatherproof grille	Intake	WG-E01
4	Weatherproof grille sound-insulated	Intake	WG-E01
5	Air hose set	Outlet	LSO 560
6	Wall insulation (20 mm)	Outlet	MI-A02
7	Weatherproof grille	Outlet	WG-A02
7	Weatherproof 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.



Space requirement "Duct" indoor installation, straight



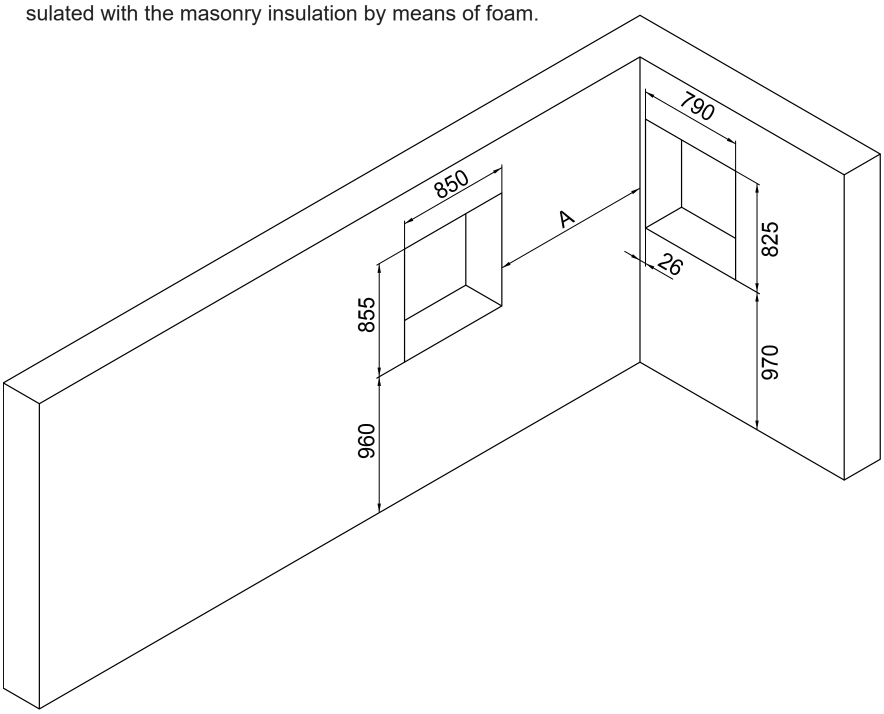
1 Heat pump

Intake
- **2** Wall connection element
- **3** Weatherproof grille

Outlet
- **4** Blow-out panel cpl. - duct connection RAL 3000
- **5** Air duct LKG10 - 1.0 m
  Air duct LKG15 - 1.5m
- **6** Wall fitting MS01
- **7** Weatherproof grille

Notice
Ducts cannot be shortened!

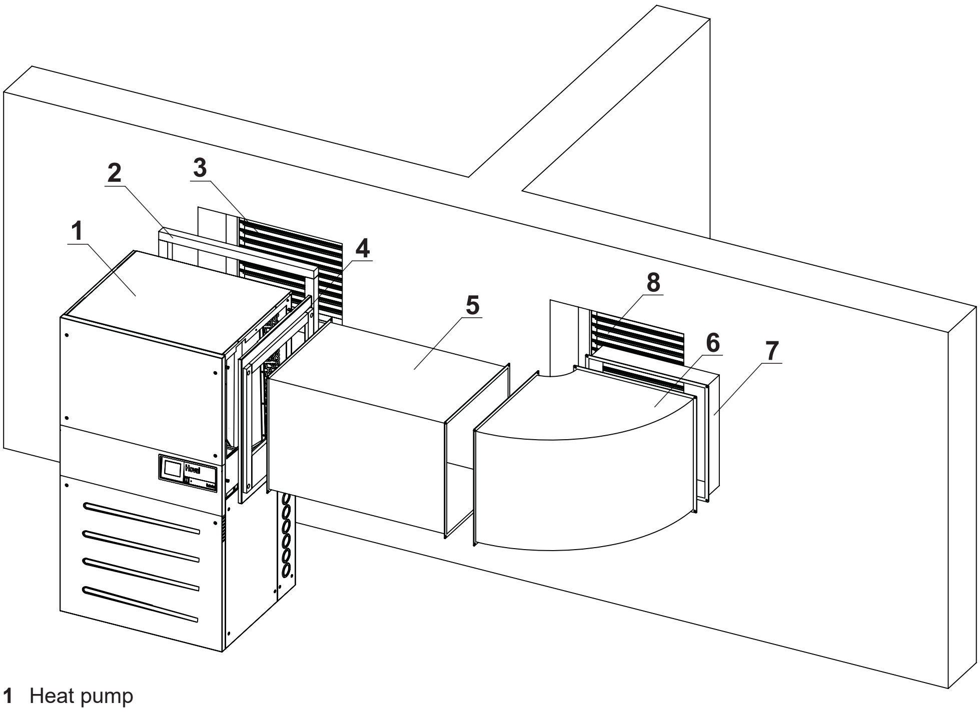
Cut-out dimensions
"Duct" indoor installation, straight
(Dimensions in mm)
- The cut-outs must be created professionally.
- The masonry support is fixed into the wall opening insulated with the masonry insulation by means of foam.



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



1 Heat pump

Intake

2 Wall connection element
3 Weatherproof grille

Outlet

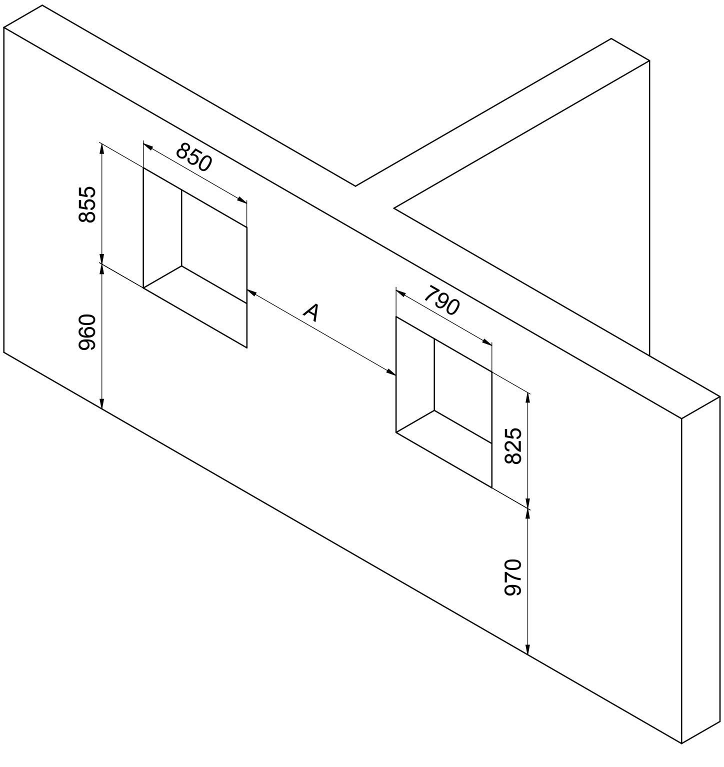
4 Blow-out panel cpl. - duct connection RAL 3000
5 Air duct LKG10 - 1.0 m
Air duct LKG15 - 1.5m
6 Air duct elbow LKB90 - 90°
7 Wall fitting MS01
8 Weatherproof grille

Notices

- Ducts cannot be shortened!
- In order to prevent an air short circuit, the partition must be positioned between the suction and exhaust opening.

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.



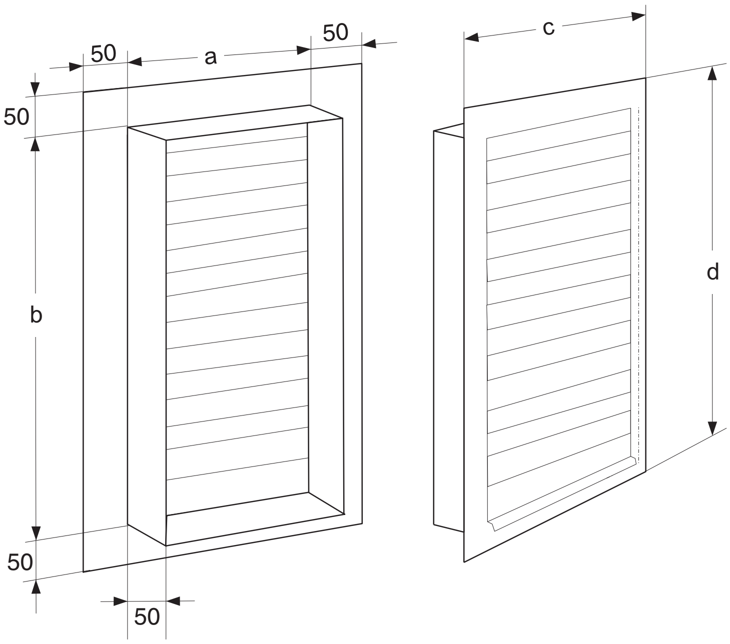
A depends on the selection of the air duct:

Length of air duct	A
1000	1126
1500	1626

Watherproof 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).

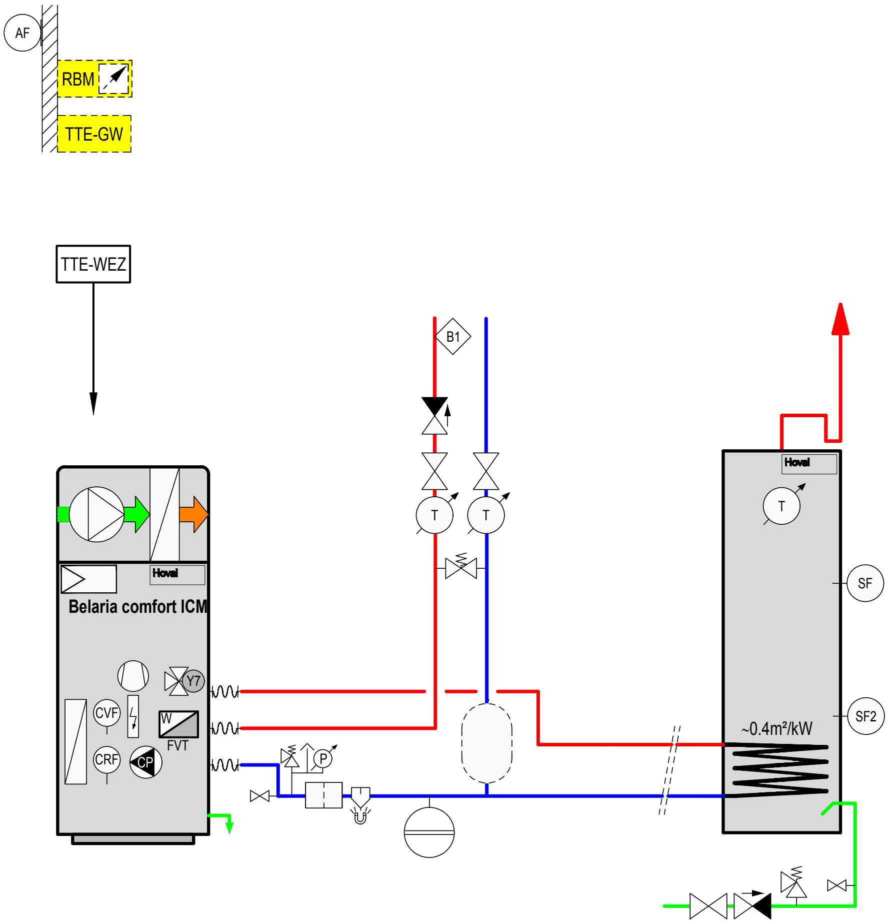
If the thermal insulation for the wall openings is provided on-site, it must be 20 mm thick!

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

Belaria® comfort ICM (8,13)

Air/water heat pump with
- Calorifier
- 1 direct circuit

Hydraulic schematic BBADE030



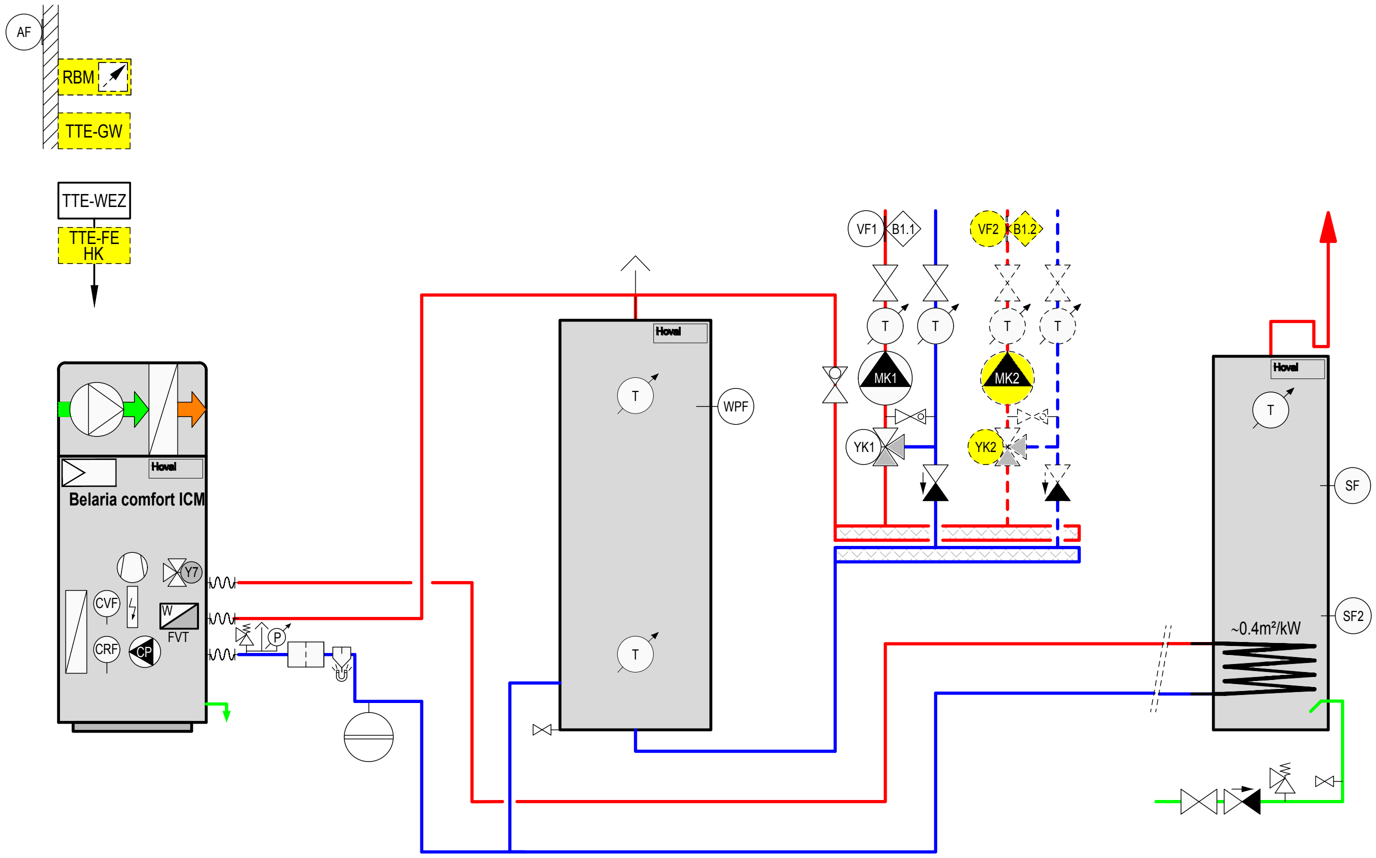
Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-WEZ	TopTronic® E basic module heat generator
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
B1	Flow temperature monitor (if required)
W	Flow sensor (FVT)
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

Belaria® comfort ICM (8,13)

Air/water heat pump with
- energy buffer storage tank
- calorifier
- 1-... mixer circuit(s)

Hydraulic schematic BBADE040



TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-PS	TopTronic® E buffer module
VF1	Flow temperature sensor 1
B1.1	Flow temperature monitor (if required)
MK1	Pump, mixer circuit 1
YK1	Actuator, mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
PF1	Buffer sensor 1
PF 2	Buffer sensor 2
W	Flow sensor (FVT)

Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature monitor (if required)
MC2	Pump, mixer circuit 2
YK2	Actuator, mixer 2

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

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
- Refrigerant circuit with electronic expansion valve, filter dryer with sight glass, suction-gas heat exchanger, manifold, high and low-pressure pressure controllers
- Two electronic starting current limiters with integrated rotary field/phase monitoring
- With efficient defrosting control via inversion of the refrigeration circuit
- Filled with refrigerant R 407C, 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.
- Flexible hoses:
  - type (15): 1″ length 1.0 m
  - type (20): 1¼″ length 1.5 m
  - type (25,30): 1½″ length 1.5 m

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 loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set


European Quality Label for Heat Pumps
ehpa

Seal of approval FWS
The Belaria® twin I, twin IR (15-30) series are certified by the seal of approval of the authorisation commission of Switzerland.

Model range

Belaria® twin I Typ	35 °C	55 °C	Heat output A2W35 kW Stage 1	Stage 2
(15)	A+	A+	8.0	15.9
(20)	A++	A+	10.4	20.8
(25)	A++	A+	12.5	25.0
(30)	A++	A+	15.2	30.4

Belaria® twin IR Typ	35 °C	55 °C	Heat output A2W35 kW Stage 1	Stage 2	Cooling capacity A35W18 kW Stage 1	Stage 2
(15)	A+	A+	8.0	15.9	10.0	18.4
(20)	A++	A+	10.4	20.8	14.3	26.6
(25)	A++	A+	12.5	25.0	15.8	30.3
(30)	A++	A+	15.2	30.4	19.0	35.5

Energy efficiency class of the compound system with control.

Options for TopTronic® E controller
- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting 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”

Water connections
- Water connection set complete (included with HP housing, assembly on-site)
- Heating and condensation connections made of flexible pipes with external thread (R) (supplied ex-works). Connection side can be selected on left or right.

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

Air/water heat pump - 2-stage

Hoval Belaria® twin I

Air/water heat pump for indoor installation
with built-in Hoval TopTronic® E control

Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Can be optionally expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion universal
  - module expansion heat accounting
- Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Incl. a complete water connection set.
Without accessories on the air side.

Delivery
One-piece construction; Compact device internally wired ready-for-installation, delivered completely packed, with flexible hoses

Belaria® twin I type	Heat output with A2W35 kW Stage 1	Heat output with A2W35 kW Stage 2	Part No.
(15)	8.0	15.9	7013 500
(20)	10.4	20.8	7013 501
(25)	12.5	25.0	7013 502
(30)	15.2	30.4	7013 503

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 brochure "Accessories" - chapter "Circulating pumps"

Notice
An energy buffer accumulator must be provided.

Matching energy buffer storage tanks see "Calorifiers"

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

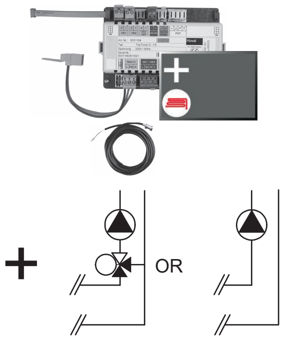
Hoval Belaria® twin IR

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

Belaria® twin IR type	Heat output with A2W35 kW Stage 1	Heat output with A2W35 kW Stage 2	Cooling capacity with A35W18 kW Stage 1	Cooling capacity with A35W18 kW Stage 2	Part No.
(15)	8.0	15.9	9.2	18.4	7013 504
(20)	10.4	20.8	13.3	26.6	7013 505
(25)	12.5	25.0	15.1	30.3	7013 506
(30)	15.2	30.4	17.7	35.5	7013 507

Part No.

TopTronic® E module expansions
for TopTronic® E basic module heat generator



TopTronic® E module expansion heating circuit TTE-FE HK

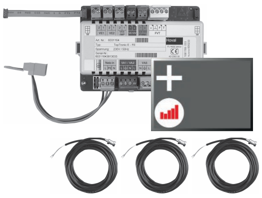
6034 576

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 circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

6037 062

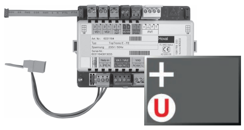
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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



TopTronic® E module expansion Universal TTE-FE UNI

6034 575

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

incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

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	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	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1½″	14-240	6042 950

Hoval recommendation

Recommended use	Installation site	Part No.
twin I/IR (15)	Outside the HP	6038 510
twin I/IR (20-30)	Outside the HP	6042 950

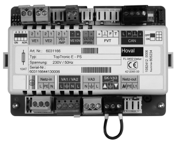
Notice

With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented up to approx. -6 °C.
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.
The flow rate sensor set must be installed inside the heat pump.

Accessories for TopTronic® E

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 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

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

	Part No.
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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

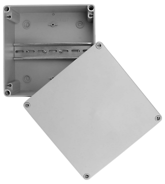
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

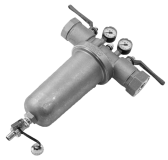
Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

Part No.: 2018 837

Screw-in electrical heating inset
for installations with technical storage tank
as emergency heating.

Type	Heat output [kW]	Installation length [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560



System water protection filter
Type: 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 loss.
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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet)

Max. flow rate: (∆p<0.1 bar): 5.5 m³/h
Weight: 6.8 kg
Water temperature: max. 90 °C

Part No.: 2076 374

Notice:
Fulfills the function of sludge separator and strainer

Strainers
see “Various system components”

Switching ball valve VBI60...L
DN 25-50, PN 16, 120 °C
- Three-way ball valve made of brass with threaded connection
- incl. seals and screw connections

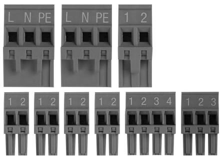
DN	Connection	kvs m³/h	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Suitable motor drive

Type	Voltage	Control signal	Actuator run time	Part No.
GLB341.9E	230 V / 50/60 Hz	2-/3-point	150 s	2070 331

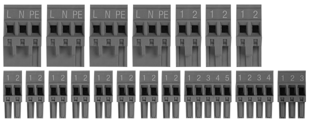
Part No.

Accessories



Expansion connector set
for the automatic heat pump 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:
- 1x 230V digital input
- 2x 230V outputs
- 4x low-voltage inputs
- 1x ratio. Input

6032 509

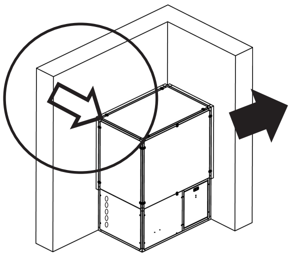


Universal connector set
for automatic heat pump ECR461
Plugs:
- 3x 230V digital input
- 4x 230V outputs
- 6x low-voltage inputs
- 2x low-voltage outputs
- 1x ratio. input
- 1x electr. expansion valve

6032 510

Part No.

Accessories of the air ducting



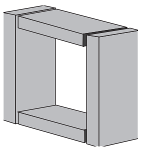
Indoor installation “standard”

Installation directly on the wall

Intake

Wall connection element WAE1
black synthetic rubber, 50 mm, for sealing the suction side directly on the wall.

for Belaria® twin I, Belaria® twin IR (15,20)	2033 866
for Belaria® twin I, Belaria® twin IR (25,30)	2033 868



Wall insulation MI 1
4-piece, black synthetic rubber, steam-tight, 20 mm thick, depth 330 mm, self-adhesive covering and protected with peel-off film.

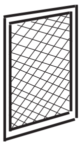
for Belaria® twin I, Belaria® twin IR (15,20)	2033 856
for Belaria® twin I, Belaria® twin IR (25,30)	2033 858

Weatherproof grille WG 1
Of aluminium with grilles for intake with wall insulation MI 1

for Belaria® twin I, Belaria® twin IR (15,20)	2033 846
for Belaria® twin I, Belaria® twin IR (25,30)	2033 848

Weatherproof grille WG1 sound-insulated for Belaria® I/IR (15,20) in aluminium with blades for the suction suitable for masonry insulation and mesh grille	2076 723

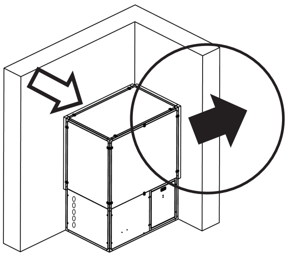
Weatherproof grille WG1 sound-insulated for Hoval Belaria® I/IR (25,30) in aluminium with blades for the suction suitable for masonry insulation and mesh grille	2076 726



Mesh grid MG 1
for wall insulation MI 1 (for air shaft, replaces weatherproof grille WG 1)

for Belaria® twin I, Belaria® twin IR (15,20)	2033 816
for Belaria® twin I, Belaria® twin IR (25,30)	2033 818

Accessories of the air ducting



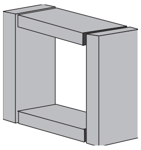
Indoor installation “standard”

Installation directly on the wall

Outlet

Wall connection element WAE2
black synthetic rubber, 50 mm, for sealing
the outlet side directly on the wall.

	Part No.
for Belaria® twin I, Belaria® twin IR (15)	2033 870
for Belaria® twin I, Belaria® twin IR (20)	2033 871
for Belaria® twin I, Belaria® twin IR (25,30)	2033 872



Wall insulation MI 2
4-piece, black synthetic rubber, steam-tight,
20 mm thick, depth 330 mm, self-adhesive
covering and protected with peel-off film

	Part No.
for Belaria® twin I, Belaria® twin IR (15)	2033 860
for Belaria® twin I, Belaria® twin IR (20)	2033 861
for Belaria® twin I, Belaria® twin IR (25,30)	2033 862

Weatherproof grille WG 2
Of aluminium with grilles for outlet
with wall insulation MI 2

	Part No.
for Belaria® twin I, Belaria® twin IR (15)	2033 850
for Belaria® twin I, Belaria® twin IR (20)	2033 851
for Belaria® twin I, Belaria® twin IR (25,30)	2033 852

	Part No.
Weatherproof grille WG2 sound-insulated	2076 724

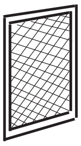
for Belaria® I/IR (15)
in aluminium with blades for the
blow-out
suitable for masonry insulation and
mesh grille

	Part No.
Weatherproof grille WG2 sound-insulated	2076 725

for Belaria® I/IR (20)
in aluminium with blades for the
blow-out
suitable for masonry insulation and
mesh grille

	Part No.
Weatherproof grille WG2 sound-insulated	2076 727

for Belaria® I/IR (25,30)
in aluminium with blades for the
blow-out
suitable for masonry insulation and
mesh grille

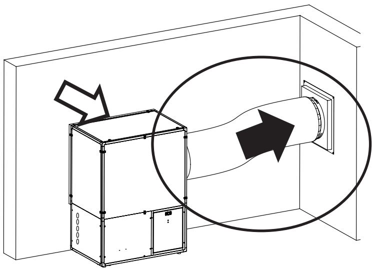


Mesh grid MG 2
for wall insulation MI 2 (for air shaft,
replaces weatherproof grille WG 2)

	Part No.
for Belaria® twin I, Belaria® twin IR (15)	2033 820
for Belaria® twin I, Belaria® twin IR (20)	2033 821
for Belaria® twin I, Belaria® twin IR (25,30)	2033 822

Part No.

Accessories of the air ducting



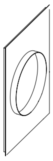
Indoor installation “flex”

“Flex” installation for individual solutions.

Intake

see “standard” installation

Lateral outlet via flexible hose (only for Belaria® twin I, twin IR (15))

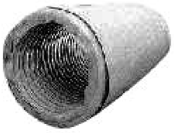


Outlet panel “Flex” AP 2 left/right
for Belaria® twin I, twin IR (15)
Side wall with outlet aperture
for air hose
Material: painted sheet steel
thermally insulated

2033 828

Air hose LS 2
for Belaria® twin I, twin IR (15)
insulated hose of plastic foil outside
insulation mineral wool
metal spiral inside with plastic foil
incl. clamps
L = 2 m (can be shortened), Ø 600 mm

6019 582

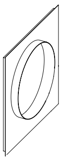


Air hose LS 3
for Belaria® twin I, twin IR (15)
insulated hose of plastic foil outside
insulation mineral wool
metal spiral inside with plastic foil
incl. clamps
L = 3 m (can be shortened), Ø 600 mm

6019 584

Air hose LS 5
for Belaria® twin I, twin IR (15)
insulated hose of plastic foil outside
insulation mineral wool
metal spiral inside with plastic foil
incl. clamps
L = 5 m (can be shortened), Ø 600 mm

6019 586



Air hose connection plate LAP3
for Belaria® twin I, twin IR (15)
of galvanised sheet steel with
thermal insulation
Pipe connection Ø 600 mm

6019 580

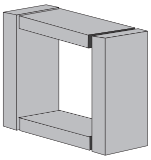
Part No.

Indoor installation “flex”

“Flex” installation for individual solutions.

Lateral outlet via flexible hose (only for Belaria® twin I, twin IR (15))

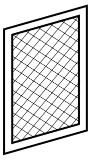
Continuation



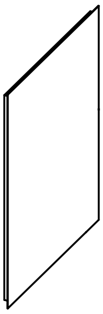
Wall insulation MI 3 — 2033 864
for Belaria® twin I, twin IR (15)
4-piece
black synthetic rubber
steam-tight
20 mm thick, depth 330 mm
self-adhesive covering and protected
with peel-off film

Weatherproof grille WG 3 — 2033 854
for Belaria® twin I, twin IR (15)
of aluminium with grilles for outlet
with duct

Weatherproof grille WG-A02 and WG3 sound-insulated — 2076 722
for Belaria® ICM (WG-A02) (blow-out),
Belaria® I/IR (15) (WG3) (suction)
in aluminium with blades for the
blow-out or the suction



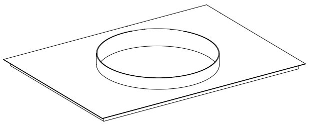
Mesh grid MG 3 — 2033 844
for Belaria® twin I, twin IR (15)
for air shaft
replaces weatherproof grilles WG 3



Panel
Side wall for covering the blow-out opening on the side. Required if the blow-off is upwards or if on-site air ducts are used.

	Part No.
for Belaria® twin I, Belaria® twin IR (15)	6019 778
for Belaria® twin I, Belaria® twin IR (20)	6020 596
for Belaria® twin I, Belaria® twin IR (25,30)	6020 595

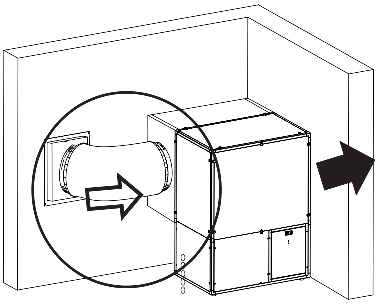
Outlet on top via flexible hose (only for Belaria® twin I, twin IR (15))



Outlet panel “Flex” AP2 on top — 6019 776
for Belaria® twin I, twin IR (15)
Panel on top with outlet aperture for
air hose Ø 600 mm
Material: painted sheet steel
thermally insulated

Part No.

Accessories of the air ducting



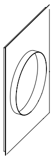
Indoor installation "vario"

"Vario" installation for individual solutions.

Air intake box ASK
Same housing type as heat pump. With connection opening with changeover function for intake with air hose to Belaria® twin I, Belaria® twin IR (15-30) or on-site air duct.

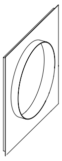
Type	Depth mm	Part No.
for Belaria® twin I, Belaria® twin IR (15,20)	700	6019 576
for Belaria® twin I, Belaria® twin IR (25,30)	700	6019 578

Intake via connection box and flexible hose (only for Belaria® twin I, twin IR (15))



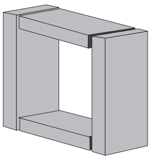
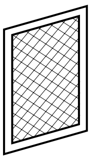
Intake panel AP1 — 6019 641
for Belaria® twin I, twin IR (15)
for intake box type ASK
with pipe connection
Material: painted sheet steel
thermally insulated

Air hose
see "flex" installation.



Air hose connection plate LAP3 — 6019 580
for Belaria® twin I, twin IR (15)
of galvanised sheet steel with
thermal insulation
Pipe connection Ø 600 mm

Accessories of the air ducting

		Part No.
	**Wall insulation MI 3** for Belaria® twin I, twin IR (15) 4-piece black synthetic rubber steam-tight 20 mm thick, depth 330 mm self-adhesive covering and protected with peel-off film	2033 864
	**Weatherproof grille WG 3** for Belaria® twin I, twin IR (15) of aluminium with grilles for outlet with duct	2033 854
	**Weatherproof grille WG-A02 and WG3 sound-insulated** for Belaria® ICM (WG-A02) (blow-out), Belaria® I/IR (15) (WG3) (suction) in aluminium with blades for the blow-out or the suction	2076 722
	**Mesh grid MG 3** for Belaria® twin I, twin IR (15) for air shaft replaces weatherproof grilles WG 3	2033 844

Installation with cold ambient temperature

Necessary for heating room temperatures < 10 °C

	**Crankcase heater** for Belaria® twin I, twin IR, Thermalia® comfort, Thermalia® twin for compressor protection For Belaria® twin I, twin IR 2 pieces are necessary!	6019 718

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 (15,20)

Type		(15)		(20)	
		1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	3.7/2.9		3.9/2.6	
Max. performance data heating in acc. with EN 14511					
• Heat output A2W35	kW [1]	8.0	15.9	10.4	20.8
• Power consumption A2W35	kW [1]	2.0	4.5	2.7	5.9
• Coefficient of performance A2W35	COP	3.9	3.6	3.9	3.5
• Heat output A-7W35	kW 1)	5.9	11.8	8.8	17.6
• Power consumption A-7W35	kW 1)	1.9	4.2	2.6	5.7
• Coefficient of performance A-7W35	COP	3.14	2.82	3.44	3.10
• Weight	kg	370		400	
• Dimensions		see Dimensions			
• Compressor type		2 x spiral-(scroll), hermetic			
• Refrigerant filling R407c	kg	8.8		11.3	
• Fan type		radial/speed-controlled			
Nominal air quantity	m^3/h	2250-4500		3000-6000	
Externally available pressure	Pa	160		200	
Max. speed in air ducts	m/s	4		4	
• Evaporator		lamellar tube Alu/Cu			
• Condenser		copper brazed stainless steel plate heat exchanger			
Heating flow and return flow	R	1″		1¼″	
• Nominal heating water quantity	m^3/h	3.20		4.49	
• Pressure drop heat pump	kPa	14		15	
• Max. operating pressure heating side	bar	6		6	
• Ranges of application for heating, hot water and cooling see diagram					
Electrical data					
Voltage					
• Compressor	V	3 x 400			
• Fan	V	3 x 400			
Frequency	Hz	50			
Voltage range	V	380-420			
Current data					
• Power consumption compressor A2/W35	kW	2.02	4.48	2.67	5.94
• Power consumption compressor A20/W55	kW	2.94	6.53	4.10	9.10
• Operating current compressor Imax.	A	5.9	11.78	7.8	14.6
• Operating current evaporator fan	A	1.00	1.00	1.00	2.80
• Starting current with jump start	A	13.60	19.37	16.4	24.2
• Principal current (external protection)	A	16		20	
	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	
• Electric heating element (external protection)	A	-		-	
	Type	-		-	

[1] kW = incl. defrosting loss

Belaria® twin I (25,30)

Type		(25)		(30)	
		1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	3.9/2.9		3.8/2.9	
Max. performance data heating in acc. with EN 14511					
• Heat output A2W35	kW [1]	12.5	25.0	15.2	30.4
• Power consumption A2W35	kW [1]	3.2	7.1	4.0	8.9
• Coefficient of performance A2W35	COP	3.9	3.5	3.8	3.4
• Heat output A-7W35	kW 1)	9.4	20.8	5.9	24.4
• Power consumption A-7W35	kW 1)	3.3	7.1	3.2	7.9
• Coefficient of performance A-7W35	COP	2.83	2.95	1.85	3.1
• Weight	kg	455		485	
• Dimensions		see Dimensions			
• Compressor type		2 x spiral-(scroll), hermetic			
• Refrigerant filling R407c	kg	12.5		13.0	
• Fan type		radial/speed-controlled			
Nominal air quantity	m³/h	3800 - 7500		4500 - 9000	
Externally available pressure	Pa	200		200	
Max. speed in air ducts	m/s	4		4	
• Evaporator		lamellar tube Alu/Cu			
• Condenser		copper brazed stainless steel plate heat exchanger			
Heating flow and return flow	R	1½″		1½″	
• Nominal heating water quantity	m³/h	4.85		5.14	
• Pressure drop heat pump	kPa	17		15	
• Max. operating pressure heating side	bar	6		6	
• Ranges of application for heating, hot water and cooling see diagram					
Electrical data					
Voltage					
• Compressor	V	3 x 400		3 x 400	
• Fan	V	3 x 400		3 x 400	
Frequency	Hz				
Voltage range	V	380-420			
Current data					
• Power consumption compressor A2/W35	kW	3.21	7.14	4.00	8.94
• Power consumption compressor A20/W55	kW	5.19	11.54	5.76	12.80
• Operating current compressor Imax.	A	9.5	17.9	11.5	21.9
• Operating current evaporator fan	A	1.40	4.20	1.40	4.20
• Starting current with jump start	A	20.2	29.7	23.6	35.1
• Principal current (external protection)	A	32		32	
	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	
• Electric heating element (external protection)	A	-		-	
	Type	-		-	

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[1] kW = incl. defrosting loss

Belaria® twin IR (15,20)

Type		(15)		(20)	
		1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	3.7/2.9		3.9/2.9	
Max. performance data heating and cooling in acc. with EN 14511					
• Heat output A2W35	kW [1]	8.0	15.9	10.4	20.8
• Power consumption A2W35	kW [1]	2.0	4.5	2.7	5.9
• Coefficient of performance A2W35	COP	3.9	3.6	3.9	3.5
• Heat output A-7W35	kW [1]	5.9	11.8	8.8	17.6
• Power consumption A-7W35	kW [1]	1.9	4.2	2.6	5.7
• Coefficient of performance A-7W35	COP	3.14	2.82	3.44	3.1
• Cooling capacity A35W18	kW	10.0	18.4	14.3	26.6
• Power consumption A35W18	kW	3.0	6.4	4.0	8.5
• Coefficient of performance A35W18	EER	3.32	2.89	3.58	3.13
• Cooling capacity A35W7	kW	6.6	12.1	10.2	19.0
• Power consumption A35W7	kW	2.6	5.6	3.6	7.7
• Coefficient of performance A35W7	EER	2.49	2.17	2.81	2.46
• Weight	kg	370		400	
• Dimensions		see Dimensions			
• Compressor type		2 x spiral-(scroll), hermetic			
• Refrigerant filling R407c	kg	12.5		13.0	
• Fan type		radial/speed-controlled			
Nominal air quantity	m^3/h	2250-4500		3000-6000	
Externally available pressure	Pa	160		200	
Max. speed in air ducts	m/s	4		4	
• Evaporator		lamellar tube Alu/Cu			
• Condenser		copper brazed stainless steel plate heat exchanger			
Heating flow and return flow	R	1″		1¼″	
• Nominal heating water quantity	m^3/h	3.20		4.49	
• Pressure drop heat pump	kPa	14		15	
• Max. operating pressure heating side	bar	6		6	
• Ranges of application for heating, hot water and cooling see diagram					
Electrical data					
Voltage					
• Compressor	V	3 x 400			
• Fan	V	3 x 400			
Frequency	Hz	50			
Voltage range	V	380-420			
Current data					
• Power consumption compressor A2/W35	kW	2.02	4.48	2.67	5.94
• Power consumption compressor A20/W55	kW	2.94	6.53	4.10	9.10
• Operating current compressor Imax.	A	5.9	10.78	7.8	14.6
• Operating current evaporator fan	A	1.00	1.00	1.00	2.80
• Starting current with jump start	A	13.6	19.37	16.4	24.2
• Principal current (external protection)	A	16		20	
	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	
• Electric heating element (external protection)	A	-		-	
	Type	-		-	

[1] kW = incl. defrosting loss

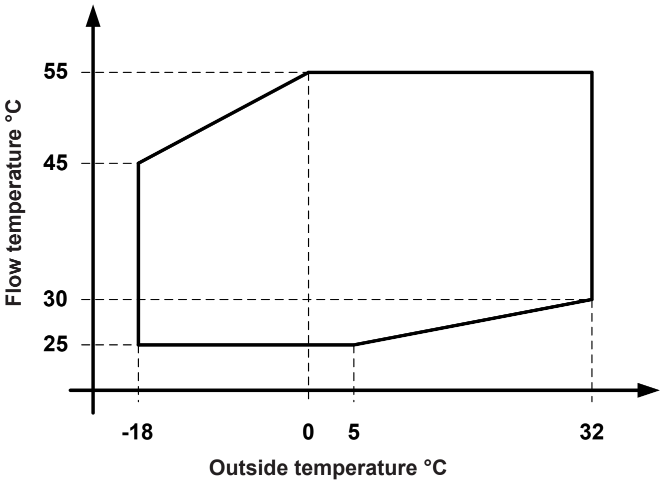
Belaria® twin IR (25,30)

Type		(25)		(30)	
		1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	3.9/2.9		3.8/2.9	
Max. performance data heating and cooling in acc. with EN 14511					
• Heat output A2W35	kW [1]	12.5	25.0	15.2	30.4
• Power consumption A2W35	kW [1]	3.2	7.1	4.0	8.9
• Coefficient of performance A2W35	COP	3.9	3.5	3.8	3.4
• Heat output A-7W35	kW [1]	9.4	20.8	12.2	24.4
• Power consumption A-7W35	kW [1]	3.3	7.1	3.3	7.9
• Coefficient of performance A-7W35	COP	2.83	2.95	3.66	3.10
• Cooling capacity A35W18	kW	15.8	30.3	19.0	35.5
• Power consumption A35W18	kW	4.6	10.0	5.8	12.3
• Coefficient of performance A35W18	EER	3.43	3.03	3.29	2.88
• Cooling capacity A35W7	kW	10.8	22.0	13.2	24.7
• Power consumption A35W7	kW	4.1	9.0	5.2	10.9
• Coefficient of performance A35W7	EER	2.61	2.44	2.57	2.25
• Weight	kg	455		485	
• Dimensions		see Dimensions			
• Compressor type		2 x spiral-(scroll). hermetic			
• Refrigerant filling R407c	kg	18.3		19.8	
• Fan type		radial/speed-controlled			
Nominal air quantity	m^3/h	3800-7500		4500-9000	
Externally available pressure	Pa	200		200	
Max. speed in air ducts	m/s	4		4	
• Evaporator		lamellar tube Alu/Cu			
• Condenser		copper brazed/stainless steel plate heat exchanger			
Heating flow and return flow	R	1½″		1½″	
• Nominal heating water quantity	m^3/h	4.85		5.14	
• Pressure drop heat pump	kPa	17		15	
• Max. operating pressure heating side	bar	6		6	
• Ranges of application for heating, hot water and cooling see diagram					
Electrical data					
Voltage					
• Compressor	V	3 x 400		3 x 400	
• Fan	V	3 x 400		3 x 400	
Frequency	Hz				
Voltage range	V	380-420			
Current data					
• Power consumption compressor A2/W35	kW	3.21	7.14	4.00	8.94
• Power consumption compressor A20/W55	kW	5.19	11.54	5.76	12.80
• Operating current compressor Imax.	A	9.5	17.9	11.5	21.9
• Operating current evaporator fan	A	1.40	4.20	1.40	4.20
• Starting current with jump start	A	20.6	29.7	23.6	35.1
• Principal current (external protection)	A	32		32	
	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	
• Electric heating element (external protection)	A	-		-	
	Type	-		-	

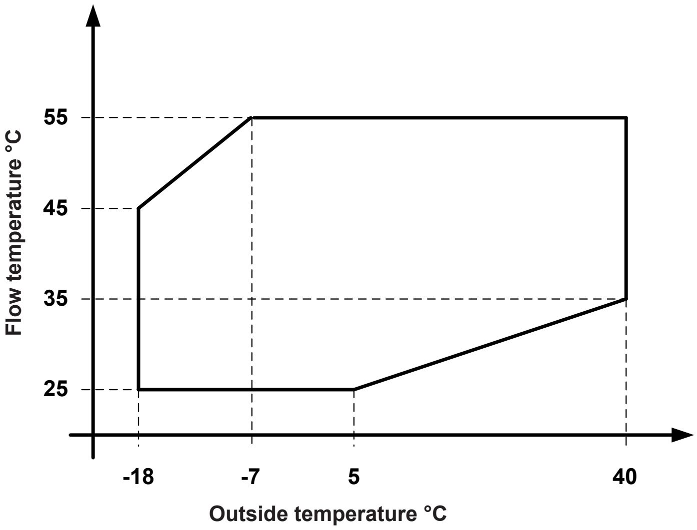
[1] kW = incl. defrosting loss

Diagrams range of application

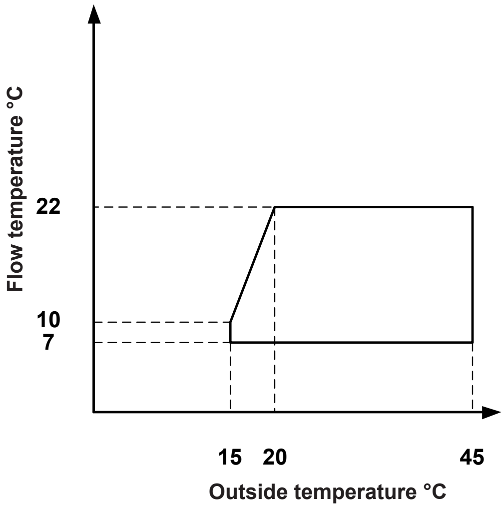
**Belaria® twin I (15-30), Belaria® twin IR (15-30)
Heating**



**Belaria® twin I (15-30), Belaria® twin IR (15-30)
Hot water**



**Belaria® twin IR (15-30)
Cooling**



Belaria® twin I, twin IR (15-30)

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		(15)		(20)		(25)		(30)	
Stage		1	2	1	2	1	2	1	2
Sound power level in the installation room	dB(A)	52	55	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, twin IR		(15)		(20)		(25)		(30)	
		1	2	1	2	1	2	1	2
Sound power level [1]	dB(A)	56	61	60	63	62	65	63	66
Sound pressure level 5 m [1]	dB(A)	40	44	41	45	43	47	44	48
Sound pressure level 10 m [1]	dB(A)	34	38	35	39	37	41	38	42

[1] Information on sound levels applies to whisper mode.
Values increase by + 4dB(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:

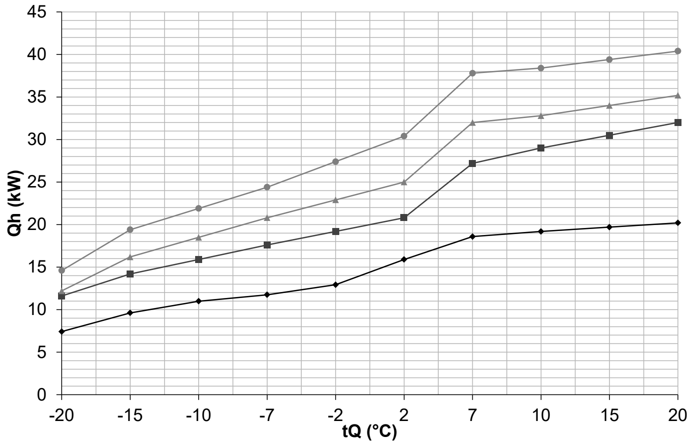
• Light well from a depth of 1.5 m:	- 4 dB(A)
• Air duct insulated on the inside with 90° elbow, L < 2 m:	- 6 dB(A)
• Air duct insulated on the inside with 90° elbow, L > 2 m:	- 8 dB(A)

Performance data - heating

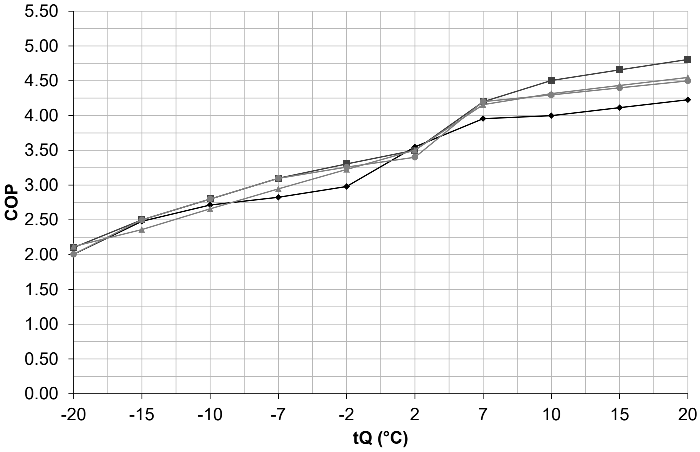
Maximum heat output allowing for defrosting losses

Belaria® twin I (15-30), twin IR (15-30)

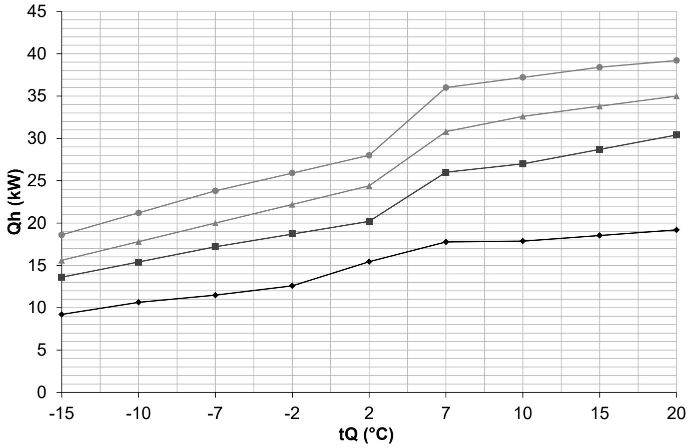
Heat output - t_{VL} 35 °C



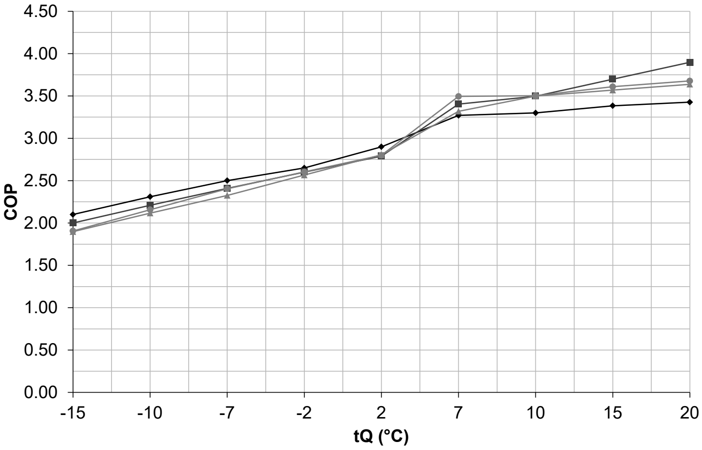
Output rating - t_{VL} 35 °C



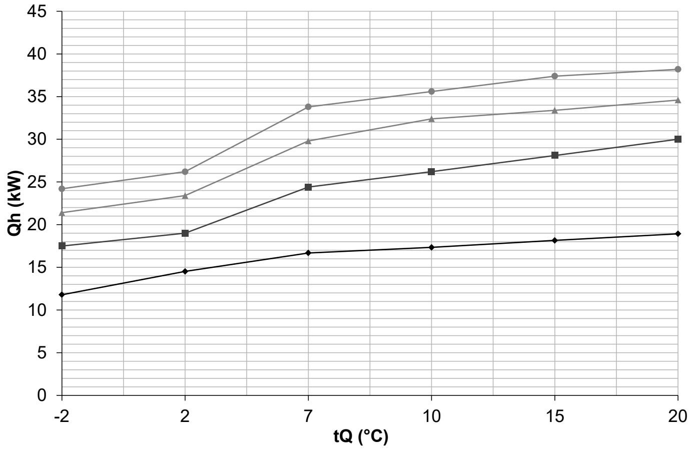
Heat output - t_{VL} 45 °C



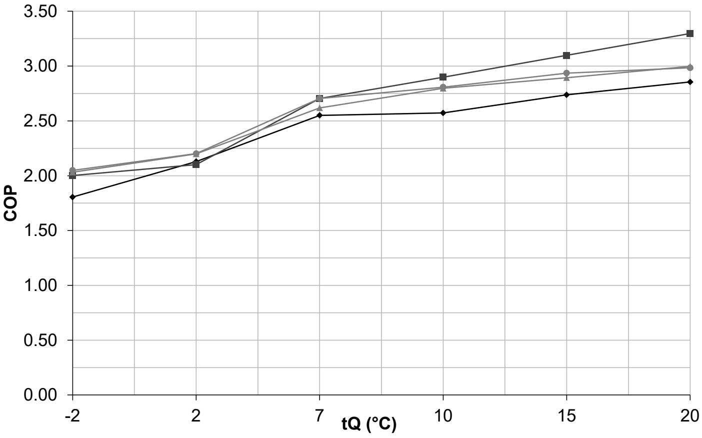
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Output rating - t_{VL} 55 °C



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

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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 (15)
—■— Belaria® twin I/IR (20)
—▲— Belaria® twin I/IR (25)
—●— Belaria® twin I/IR (30)

Performance data - heating

Belaria® twin I (15-30), twin IR (15-30)

Indications acc. to EN 14511

			(15)			(20)			(25)			(30)	
tVL °C	**tQ °C**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**	**Qh kW**	**P kW**	**COP**
35	-20	7.4	3.7	2.01	11.6	5.5	2.10	12.2	5.8	2.12	14.6	7.3	2.01
	-15	9.6	3.9	2.48	14.2	5.7	2.50	16.2	6.9	2.36	19.4	7.8	2.50
	-10	11.0	4.1	2.71	15.9	5.7	2.80	18.5	7.0	2.66	21.9	7.8	2.80
	-7	11.8	4.2	2.82	17.6	5.7	3.10	20.8	7.1	2.95	24.4	7.9	3.10
	-2	12.9	4.3	2.98	19.2	5.8	3.30	22.9	7.1	3.23	27.4	8.4	3.26
	2	15.9	4.5	3.55	20.8	5.9	3.50	25.0	7.1	3.50	30.4	8.9	3.40
	7	18.6	4.7	3.96	27.2	6.5	4.20	32.0	7.7	4.16	37.8	9.0	4.20
	10	19.2	4.8	4.00	29.0	6.4	4.50	32.8	7.6	4.32	38.4	8.9	4.30
	15	19.7	4.8	4.11	30.5	6.6	4.66	34.0	7.7	4.43	39.4	9.0	4.40
	20	20.2	4.8	4.23	32.0	6.7	4.80	35.2	7.7	4.55	40.4	9.0	4.50
45	-15	9.2	4.6	2.10	13.6	6.8	2.00	15.6	8.2	1.90	18.6	9.8	1.91
	-10	10.6	5.0	2.31	15.4	7.0	2.21	17.8	8.4	2.12	21.2	9.8	2.16
	-7	11.5	5.2	2.50	17.2	7.1	2.41	20.0	8.6	2.33	23.8	9.9	2.40
	-2	12.6	5.4	2.65	18.7	7.2	2.60	22.2	8.7	2.57	25.9	10.0	2.60
	2	15.4	5.5	2.90	20.2	7.2	2.79	24.4	8.7	2.80	28.0	10.0	2.80
	7	17.8	5.5	3.27	26.0	7.6	3.40	30.8	9.3	3.32	36.0	10.3	3.50
	10	17.9	5.8	3.30	27.0	7.7	3.50	32.6	9.3	3.50	37.2	10.6	3.50
	15	18.5	5.7	3.38	28.7	7.8	3.70	33.8	9.5	3.57	38.4	10.6	3.61
	20	19.2	5.6	3.43	30.4	7.8	3.90	35.0	9.6	3.64	39.2	10.7	3.68
55	-2	11.8	6.5	1.81	17.5	8.7	2.00	21.4	10.5	2.03	24.2	11.8	2.05
	2	14.5	6.8	2.13	19.0	9.0	2.10	23.4	10.6	2.20	26.2	11.9	2.20
	7	16.7	6.5	2.55	24.4	9.0	2.71	29.8	11.4	2.62	33.8	12.5	2.70
	10	17.3	6.7	2.57	26.2	9.0	2.90	32.4	11.6	2.80	35.6	12.7	2.81
	15	18.2	6.6	2.74	28.1	9.1	3.10	33.4	11.5	2.89	37.4	12.7	2.94
	20	18.9	6.6	2.86	30.0	9.1	3.30	34.6	11.5	3.00	38.2	12.8	2.98

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

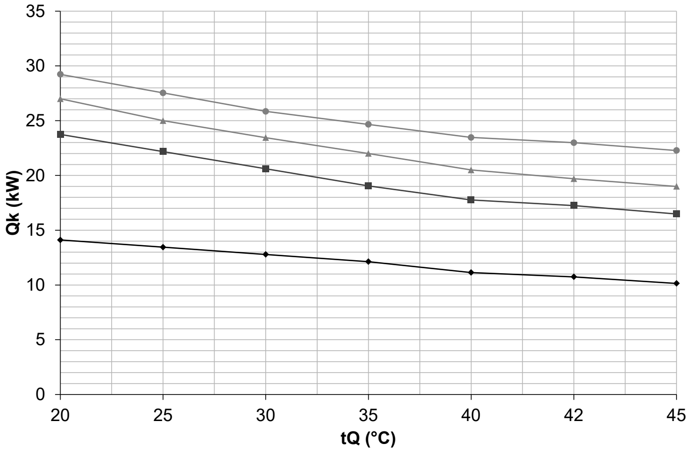
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - cooling

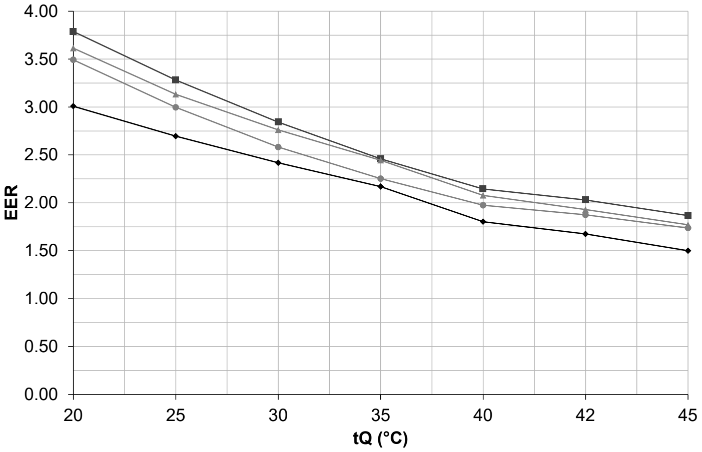
Maximum cooling capacity

Belaria® twin IR (15-30)

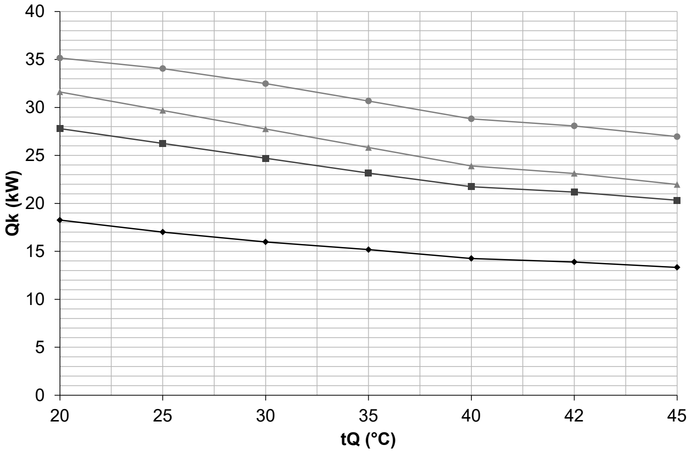
Cooling capacity - t_{VL} 7 °C



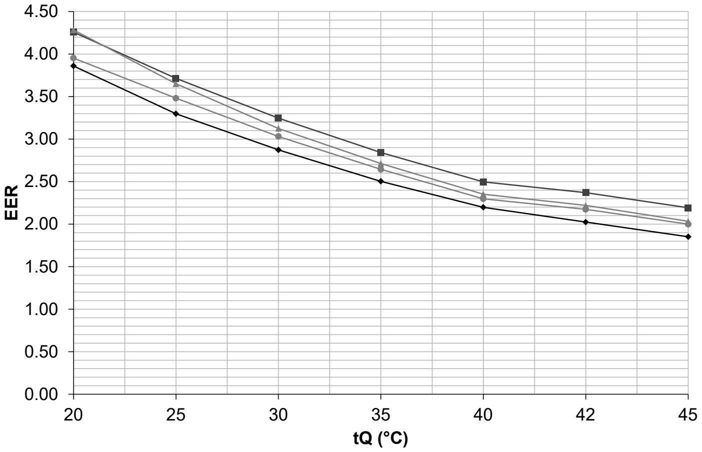
Output rating - t_{VL} 7 °C



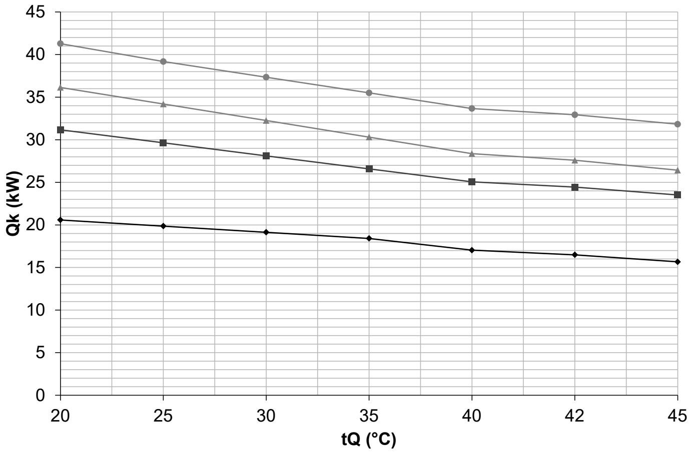
Cooling capacity - t_{VL} 13 °C



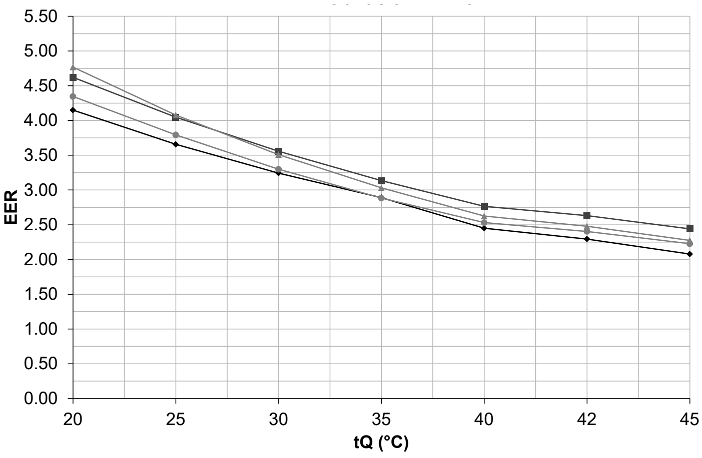
Output rating - t_{VL} 13 °C



Cooling capacity - t_{VL} 18 °C



Output rating - t_{VL} 18 °C



tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
EER = Coefficient of Performance for the overall unit in accordance with standard EN 14511

◆ Belaria® twin IR (15)
■ Belaria® twin IR (20)
▲ Belaria® twin IR (25)
● Belaria® twin IR (30)

Performance data - cooling

Belaria® twin IR

Indications acc. to EN14511

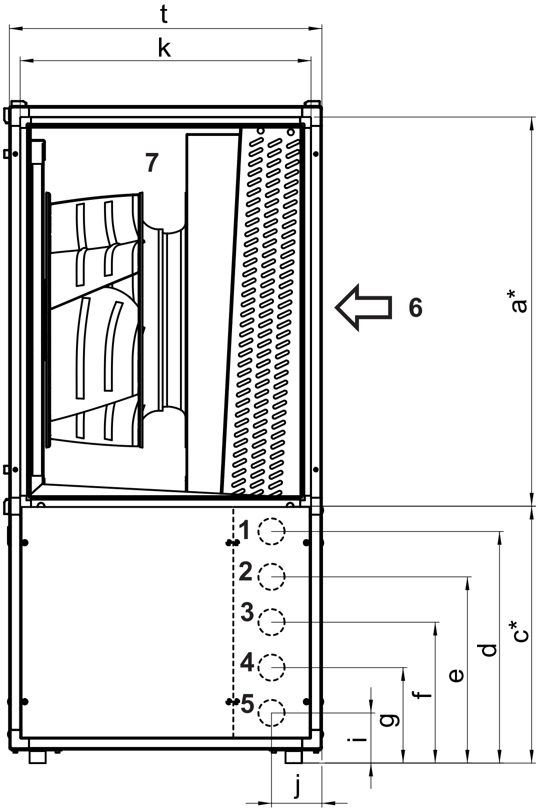
			(15)			(20)			(25)			(30)	
tVL °C	tQ °C	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER
7	20	14.1	4.7	3.01	23.8	6.3	3.79	27.0	7.5	3.61	29.2	8.4	3.49
	25	13.5	5.0	2.70	22.2	6.8	3.28	25.0	8.0	3.13	27.5	9.2	3.00
	30	12.8	5.3	2.42	20.6	7.3	2.84	23.5	8.5	2.76	25.9	10.0	2.58
	35	12.1	5.6	2.17	19.0	7.7	2.46	22.0	9.0	2.44	24.7	10.9	2.25
	40	11.1	6.2	1.80	17.8	8.3	2.14	20.5	9.9	2.08	23.5	11.9	1.97
	42	10.7	6.4	1.68	17.3	8.5	2.03	19.7	10.2	1.93	23.0	12.3	1.88
	45	10.1	6.8	1.50	16.5	8.8	1.87	19.0	10.7	1.77	22.3	12.8	1.74
10	20	16.9	4.6	3.67	25.8	6.4	4.03	29.3	7.0	4.18	32.3	8.8	3.65
	25	15.3	5.0	3.06	24.2	6.9	3.50	27.4	7.9	3.49	31.2	9.5	3.27
	30	13.9	5.3	2.61	22.6	7.4	3.04	25.5	8.7	2.94	28.9	10.4	2.79
	35	13.2	5.9	2.25	21.1	7.9	2.66	23.6	9.3	2.54	27.5	11.3	2.44
	40	12.6	6.2	2.03	19.7	8.5	2.33	21.7	9.9	2.19	26.1	12.2	2.14
	42	12.3	6.7	1.85	19.2	8.7	2.20	21.0	10.1	2.07	25.5	12.6	2.03
	45	11.9	7.0	1.70	18.4	9.0	2.03	19.8	10.5	1.88	24.6	13.1	1.88
13	20	18.3	4.7	3.86	27.8	6.5	4.26	31.6	7.4	4.28	35.2	8.9	3.95
	25	17.0	5.2	3.30	26.2	7.1	3.71	29.7	8.1	3.65	34.0	9.8	3.48
	30	16.0	5.6	2.87	24.7	7.6	3.25	27.8	8.9	3.13	32.5	10.7	3.03
	35	15.2	6.1	2.50	23.2	8.1	2.84	25.8	9.5	2.71	30.7	11.6	2.64
	40	14.3	6.5	2.20	21.7	8.7	2.50	23.9	10.2	2.35	28.8	12.5	2.30
	42	13.9	6.9	2.02	21.2	8.9	2.37	23.1	10.4	2.22	28.1	12.9	2.17
	45	13.3	7.2	1.85	20.3	9.3	2.19	22.0	10.8	2.03	27.0	13.5	2.00
15	20	19.2	4.8	3.98	29.1	6.6	4.41	33.9	7.7	4.38	37.1	8.9	4.15
	25	18.1	5.3	3.45	27.6	7.2	3.85	32.0	8.4	3.80	36.0	9.9	3.62
	30	17.4	5.7	3.03	26.1	7.7	3.37	30.0	9.1	3.30	34.9	11.0	3.18
	35	16.5	6.2	2.66	24.5	8.3	2.96	28.0	9.8	2.88	32.8	11.8	2.78
	40	15.4	6.7	2.30	23.1	8.8	2.61	26.1	10.4	2.50	30.7	12.8	2.40
	42	14.9	7.0	2.13	22.5	9.1	2.48	25.3	10.7	2.37	29.8	13.2	2.27
	45	14.3	7.3	1.94	21.6	9.4	2.29	24.1	11.1	2.17	28.5	13.7	2.08
18	20	20.6	5.0	4.15	31.2	6.7	4.62	36.1	7.6	4.77	41.3	9.5	4.35
	25	19.9	5.4	3.66	29.6	7.3	4.05	34.2	8.4	4.08	39.2	10.3	3.79
	30	19.1	5.9	3.24	28.1	7.9	3.56	32.3	9.2	3.51	37.3	11.3	3.30
	35	18.4	6.4	2.89	26.6	8.5	3.13	30.3	10.0	3.03	35.5	12.3	2.88
	40	17.0	7.0	2.45	25.1	9.1	2.77	28.4	10.8	2.62	33.7	13.3	2.53
	42	16.5	7.2	2.29	24.4	9.3	2.63	27.6	11.1	2.48	32.9	13.7	2.40
	45	15.7	7.5	2.08	23.5	9.6	2.44	26.4	11.6	2.28	31.8	14.3	2.23
20	20	23.4	5.0	4.70	32.9	6.9	4.76	38.4	8.1	4.74	46.2	9.5	4.87
	25	22.2	5.5	4.04	31.3	7.5	4.18	36.2	8.8	4.12	43.5	10.5	4.14
	30	21.0	6.1	3.46	29.7	8.1	3.67	33.9	9.5	3.59	40.7	11.5	3.53
	35	19.8	6.5	3.03	28.2	8.6	3.26	31.6	10.1	3.12	37.9	12.6	3.02
	40	18.3	7.1	2.58	26.6	9.2	2.88	29.7	10.9	2.73	35.2	13.6	2.59
	42	17.7	7.3	2.41	25.9	9.5	2.74	28.9	11.2	2.59	34.0	14.0	2.44
	45	16.8	7.7	2.19	25.0	9.8	2.55	27.7	11.5	2.41	32.4	14.6	2.22
22	20	26.2	5.0	5.25	34.7	7.1	4.89	38.8	8.2	4.75	47.8	9.5	5.02
	25	24.5	5.6	4.41	33.0	7.7	4.31	36.8	8.9	4.16	45.3	10.6	4.27
	30	22.8	6.1	3.74	31.4	8.2	3.81	34.9	9.6	3.65	42.9	11.7	3.66
	35	21.2	6.7	3.17	29.7	8.8	3.37	32.9	10.3	3.21	40.4	12.8	3.15
	40	19.5	7.2	2.70	28.1	9.4	2.99	31.0	10.9	2.83	37.9	13.9	2.73
	42	18.9	7.5	2.53	27.4	9.6	2.85	30.2	11.2	2.69	36.9	14.3	2.58
	45	17.9	7.8	2.29	26.4	10.0	2.66	29.0	11.6	2.50	35.4	15.0	2.36

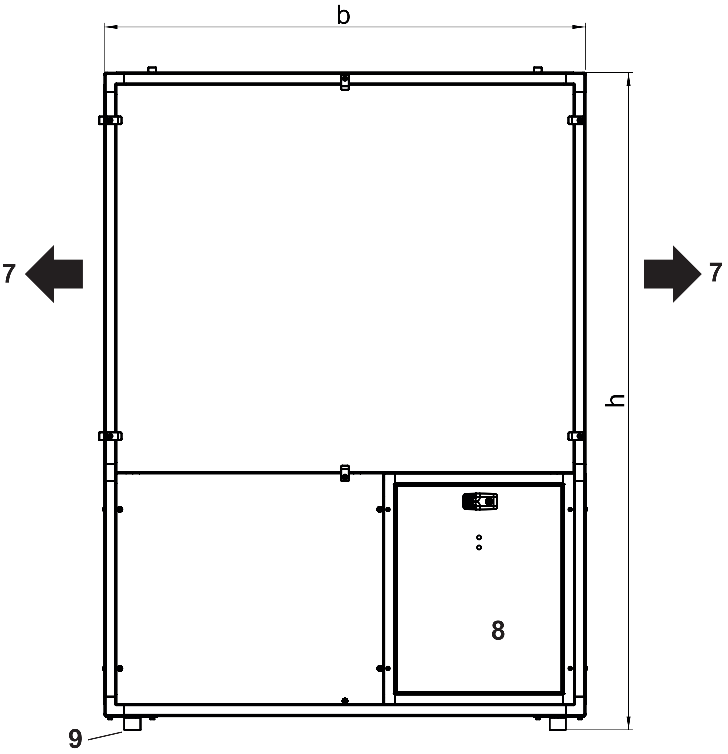
tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW)
EER = Energy Efficiency Rate for the overall unit in accordance with standard EN 14511

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

Belaria® twin I (15-30), Belaria® twin IR (15-30)

(Dimensions in mm)





1 Heating flow with flexible connection hose
Belaria® twin I, Belaria® twin IR (15): R 1″;
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 (15): R 1″;
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
Blow-off directions: optionally towards the left or right side (repositioning on-site)
Accessories for indoor installation “flex”:
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 w ± 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
(15)	1200	1635	965	640	575	460	350	240	125	125	720	780
(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 (15-30) (only available in Switzerland)

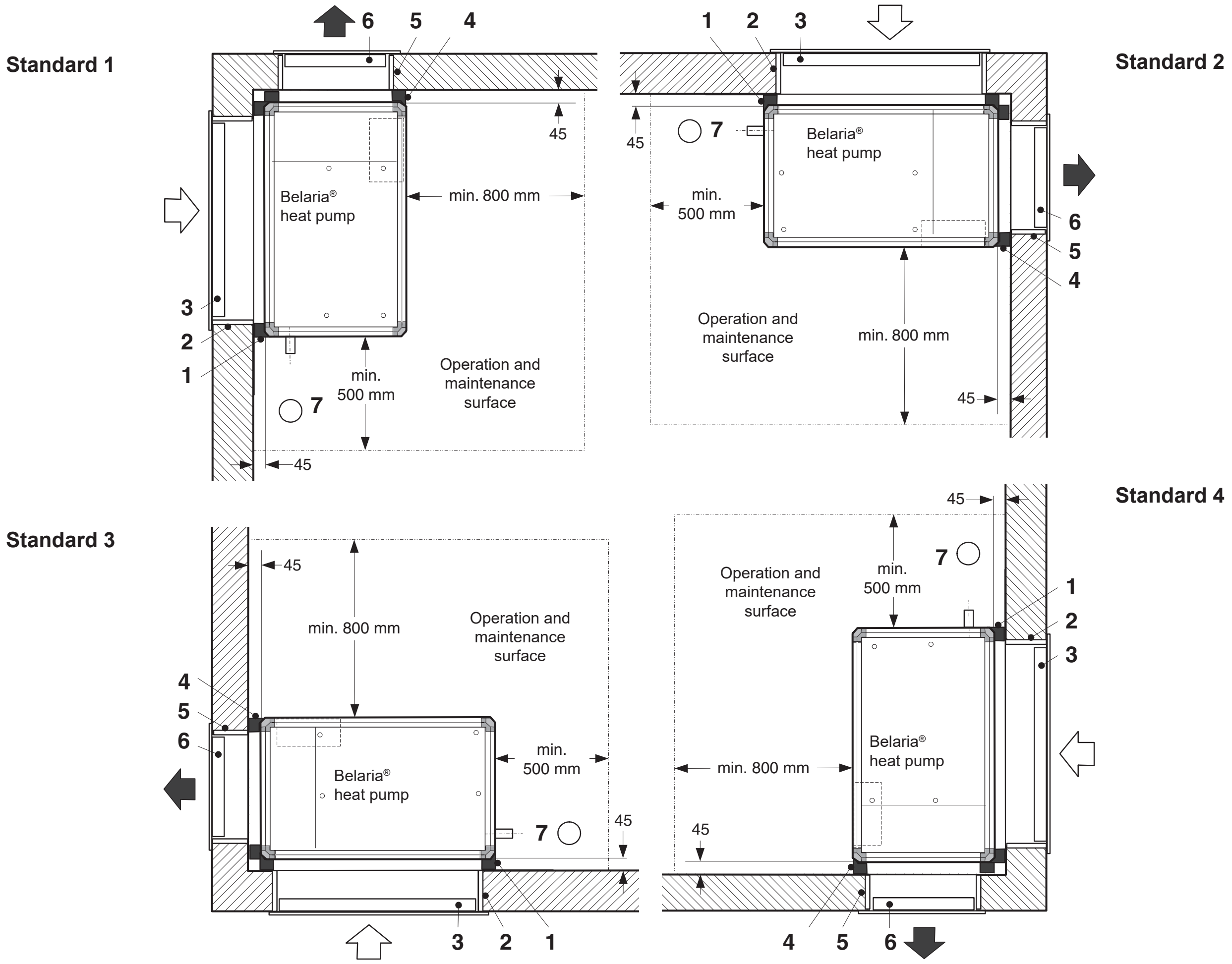
Space requirement “standard” installation with wall insulation MI

“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 (15-30), Belaria® twin IR (15-30)	Application	Accessories Type	Belaria® twin I, Belaria® twin IR (15) Part No.	(20) Part No.	(25) Part No.	(30) Part No.
Heat pump	Indoor installation					
1 Wall connection element	Intake	WAE1	2033 866	2033 866	2033 868	2033 868
2 Wall insulation	Intake	MI 1	2033 856	2033 856	2033 858	2033 858
3 Weatherproof grille	Intake	WG 1	2033 846	2033 846	2033 848	2033 848
3 Weatherproof grille sound-insulated	Intake	WG 1	2076 723	2076 723	2076 726	2076 726
4 Wall connection element	Outlet	WAE2	2033 870	2033 871	2033 872	2033 872
5 Wall insulation	Outlet	MI 2	2033 860	2033 861	2033 862	2033 862
6 Weatherproof grille	Outlet	WG 2	2033 850	2033 851	2033 852	2033 852
6 Weatherproof grille sound-insulated	Outlet	WG 2	2076 724	2076 725	2076 727	2076 727
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.

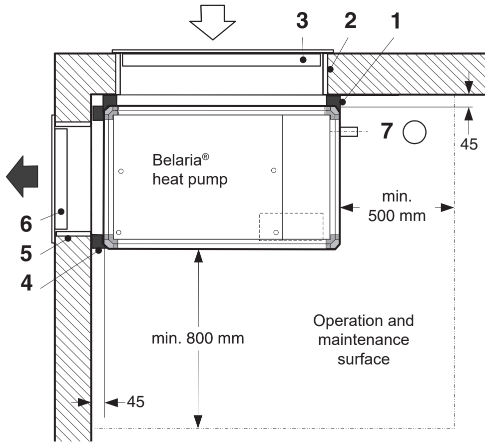
Cut-outs
The cut-outs must be created professionally and without cold bridges!
The dimensions of the cut-outs are “clear dimensions” measured from the finished floor!

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.

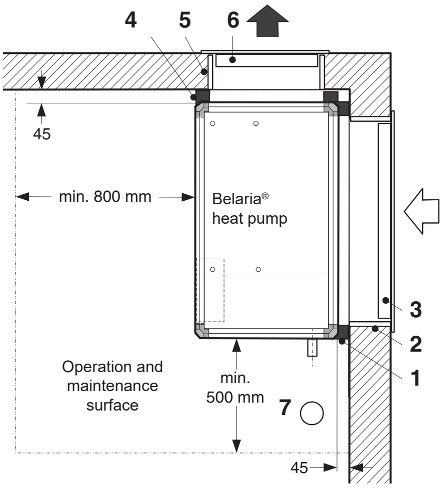
The blow-off opening on the right side should be preferred as a result of accessibility for service!

Outlet to the left

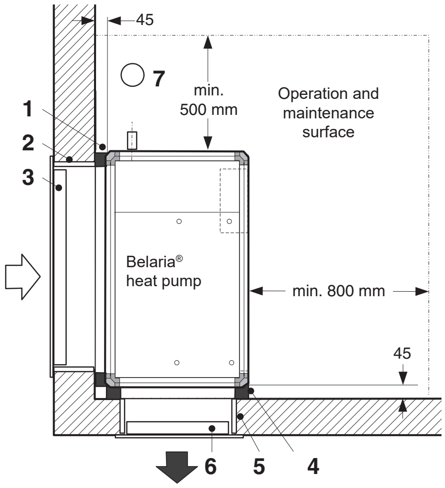
Standard 5



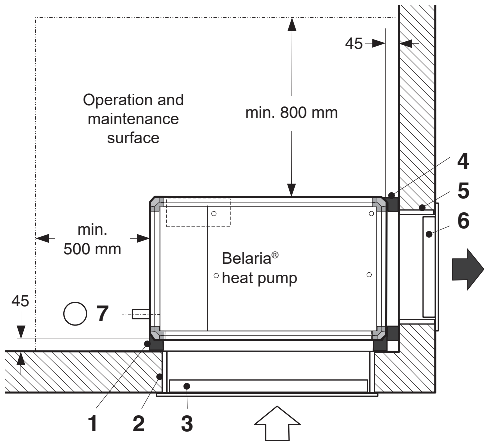
Standard 6



Standard 7



Standard 8

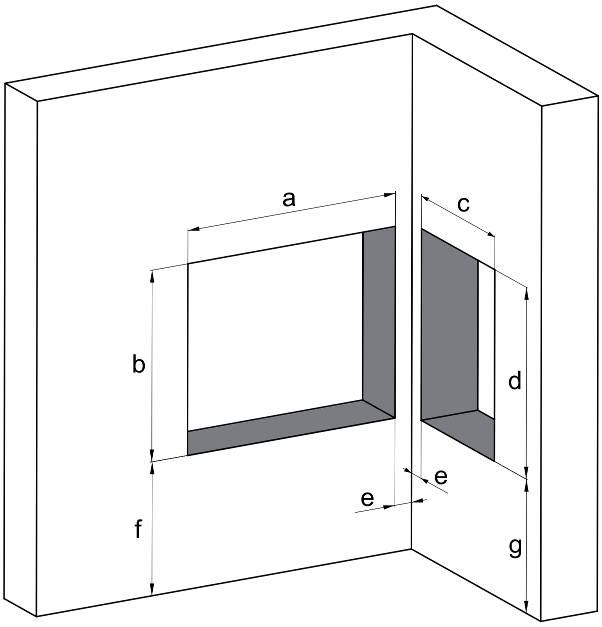


Belaria® twin I (15-30), Belaria® twin IR (15-30)	Application	Accessories	Belaria® twin I, Belaria® twin IR			
		Type	(15) Part No.	(20) Part No.	(25) Part No.	(30) Part No.
Heat pump	Indoor installation					
1 Wall connection element	Intake	WAE1	2033 866	2033 866	2033 868	2033 868
2 Wall insulation	Intake	MI 1	2033 856	2033 856	2033 858	2033 858
3 Weatherproof grille	Intake	WG 1	2033 846	2033 846	2033 848	2033 848
3 Weatherproof grille sound-insulated	Intake	WG 1	2076 723	2076 723	2076 726	2076 726
4 Wall connection element	Outlet	WAE2	2033 870	2033 871	2033 872	2033 872
5 Wall insulation	Outlet	MI 2	2033 860	2033 861	2033 862	2033 862
6 Weatherproof grille	Outlet	WG 2	2033 850	2033 851	2033 852	2033 852
6 Weatherproof grille sound-insulated	Outlet	WG 2	2076 724	2076 725	2076 727	2076 727
7 Condensate drain (on site, siphon height approx.100 mm)						

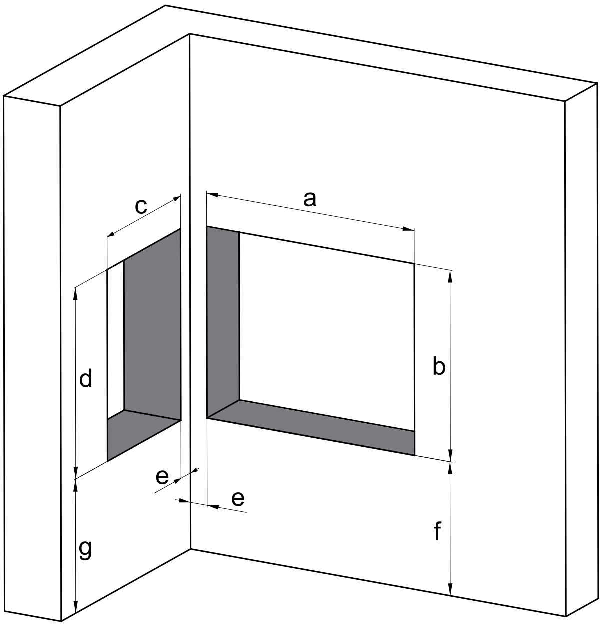
Space requirement “standard” installation with wall insulation MI

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 the finished floor

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

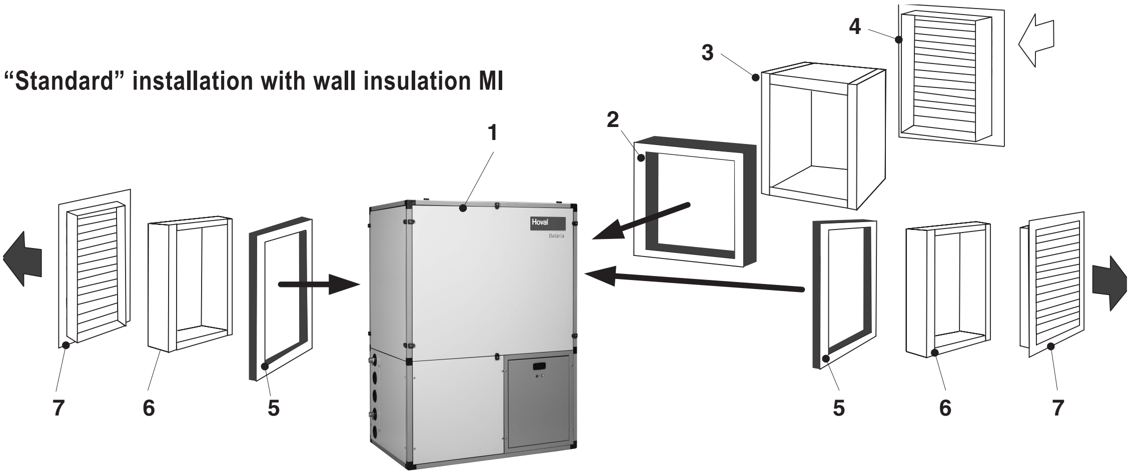


Standard installation 5–8
Air outlet to the left



Belaria® twin I, **Belaria® twin IR**	a	b	c	d	e	f	g
				Cut-out dimensions			
(15)	1140	950	720	950	70	640	640
(20)	1140	950	820	950	70	740	740
(25,30)	1240	1150	920	1150	70	740	740

“Standard” installation with wall insulation MI



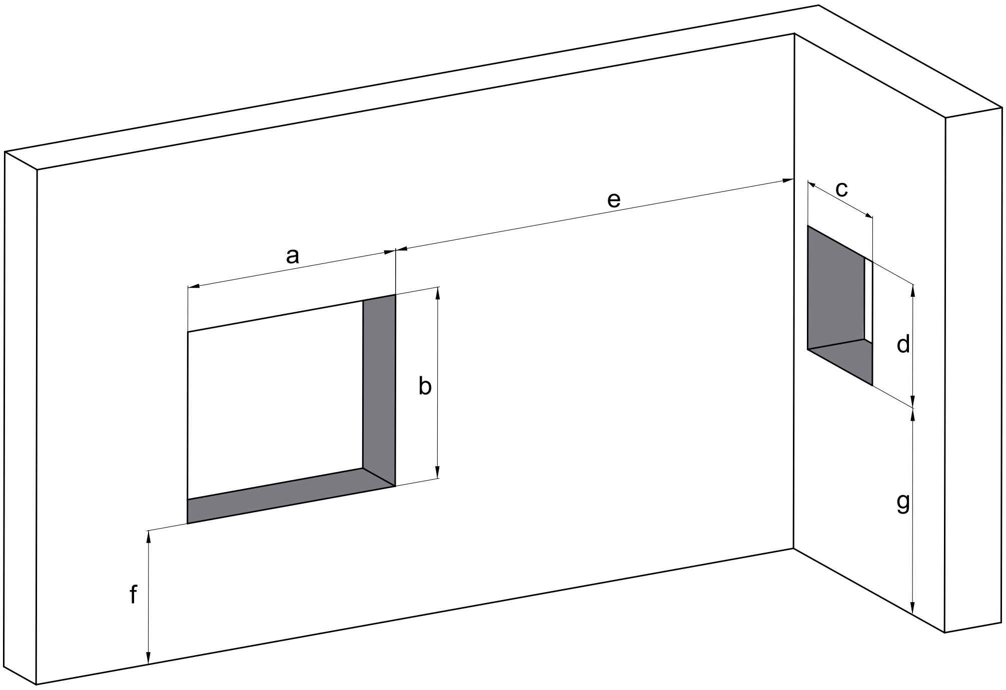
1 Heat pump
Intake
2 Wall connection element
3 Wall insulation (20 mm)
4 Weatherproof grille
4 Weatherproof grille sound-insulated

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

Space requirement “flex” installation Belaria® twin I and Belaria® twin IR (15)

Cut-out dimensions
“Flex” installations with wall insulation MI
(Dimensions in mm)

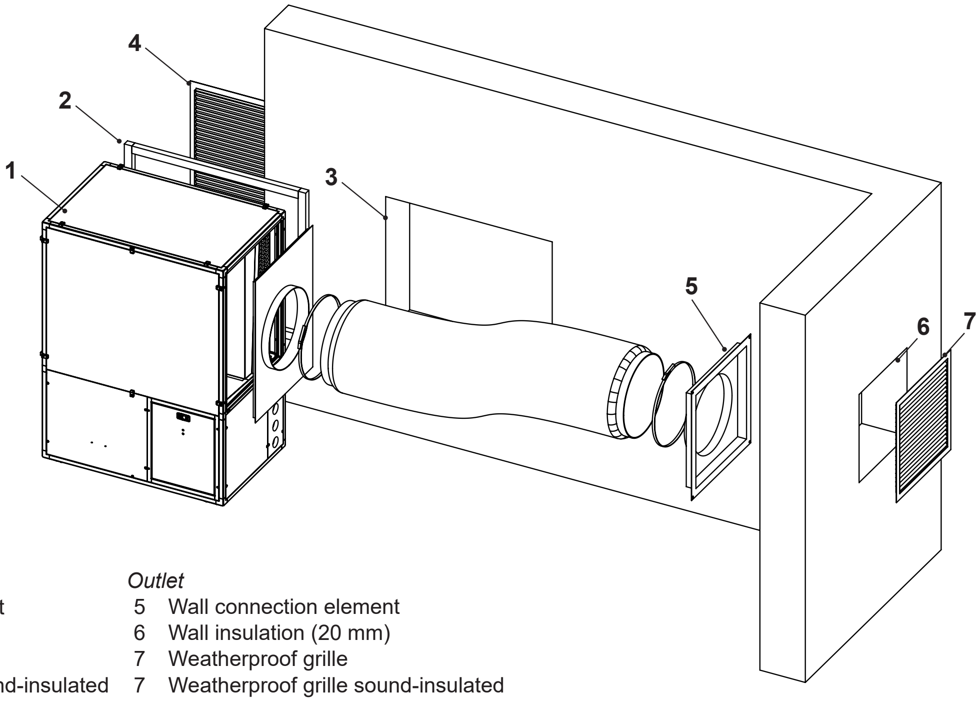
- The cut-outs must be created professionally.
- Cut-out dimensions from top edge of the finished floor



Belaria® twin I, **Belaria® twin IR**	a	b	c	d	e	g min.	f
(15)	1140	950	760	760	> 1000	840	640

(Header spans a–f: **Cut-out dimensions**)

“Flex” 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

Space requirement “vario” installation Belaria® twin I and Belaria® twin IR (15)

Corner installation “standard/vario” combination
(Dimensions in mm from finished floor)

Intake:
“Vario” with air box as well as air hose and wall feed-through

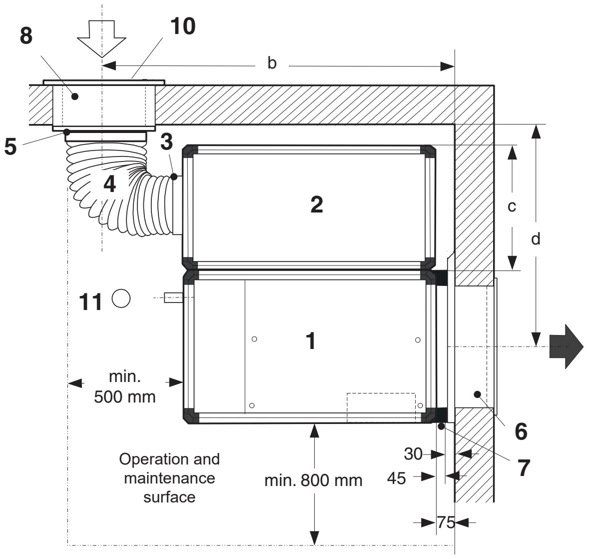
Outlet:
“Standard” with wall lead-through

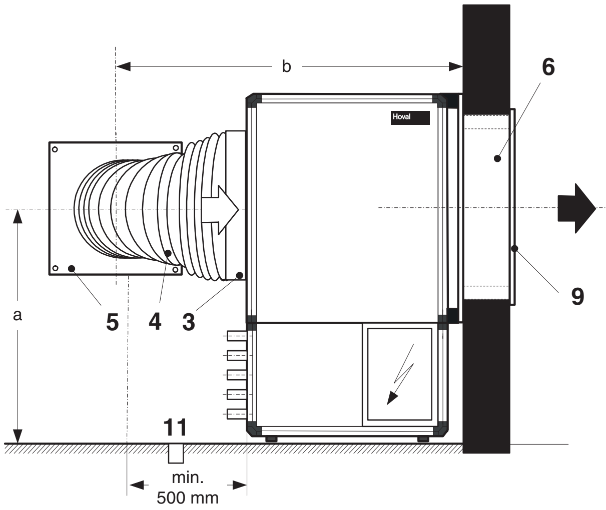
Air ducting
The minimum bending radius (1R) as well as the operating and maintenance surface must be maintained.

Cut-out
The positions of the openings are to be defined in relation to the system.

Cut-out dimensions
see “standard” or “flex” installation.

Blow-out to left mirror image





Belaria® twin IR	a	b	c	d
(15)	1140	≥ 2000	700	≥ 1290

	Belaria® twin I (15), Belaria® twin IR (15)	Accessories Type	Belaria® twin I, Belaria® twin IR (15) Part No.
1	Heat pump		
2	Air intake box	ASK	6019 576
3	Air hose connection plate, round	AP1	6019 641
4	Air hose, length 2 m	LS 2	6019 582
5	Air hose connection plate, round	LAP3	6019 580
6	Wall insulation	MI 2	2033 860
7	Wall connection element outlet	WAE2	2033 870
8	Wall insulation	MI 3	2033 864
9	Weatherproof grille	WG 2	2033 850
9	Weatherproof grille sound-insulated	WG 2	2076 724
10	Weatherproof grille	WG 3	2033 854
10	Weatherproof grille sound-insulated	WG 3	2076 722
11	Condensate drain (on site, siphon height approx.100 mm)		

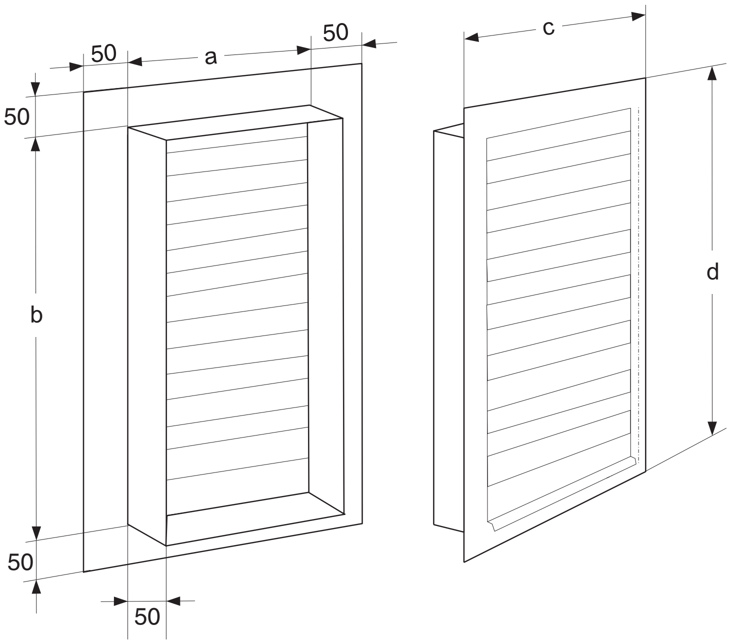
Weatherproof grille

(Dimensions in mm)

Weatherproof grille made from aluminium with mesh grid.

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

If the heat 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
WG 1	(15,20)	Intake	1100	900	1180	1000
WG 1	(25,30)	Intake	1200	1100	1280	1200
WG 2	(15)	Outlet	680	900	760	1000
WG 2	(20)	Outlet	780	900	860	1000
WG 2	(25,30)	Outlet	880	1100	960	1200
WG 3	(15)	Vario	720	700	800	800

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 already fitted. Heating side pipework in the casing.

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)

Seal of approval FWS
The Belaria® twin A and Belaria® twin AR (17-32) series are certified by the seal of approval of the authorisation commission of Switzerland.

Model range

Belaria® twin A Type			Heat output A2W35	
			Stage 1	Stage 2
	35 °C	55 °C	kW	
(17)	A++	A++	10.3	17.2
(24)	A+++	A++	13.1	23.7
(32)	A+++	A++	18.6	31.6

Belaria® twin AR Type			Heat output A2W35		Cooling capacity A35W7	
			Stage 1	Stage 2	Stage 1	Stage 2
	35 °C	55 °C	kW		kW	
(17)	A+++	A++	10.3	17.2	9.2	17.6
(24)	A+++	A++	13.1	23.7	12.7	22.8
(32)	A+++	A++	18.6	31.6	16.1	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 loading 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 accounting 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"

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

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

Air/water heat pump for outdoor installation without electrical box.

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

Belaria® twin A type	Heat output A2W35 kW Stage 1	Stage 2	Part No.
(17)	10.3	17.2	7016 819
(24)	13.1	23.7	7016 820
(32)	18.6	31.6	7016 821

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

Hoval Belaria® twin AR

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

Belaria® twin AR type	Heat output with A2W35 kW Stage 1	Stage 2	Cooling capacity with A35W7 kW Stage 1	Stage 2	Part No.
(17)	10.3	17.2	9.2	17.6	7016 822
(24)	13.1	23.7	12.7	22.8	7016 823
(32)	18.6	31.6	16.1	28.8	7016 824

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 brochure “Accessories” - chapter “Circulating pumps”

Energy efficiency class
see Description

Notice
An energy buffer accumulator must be provided.

Matching energy 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.

Part No.

Accessories

Electrical box
for wall installation in building interiors with built-in Hoval TopTronic® E controller
Integrated control functions for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer
- 1 DHW charging circuit
- Bivalent and cascade management

• Option of extending by max. 1 module extension:
- heating circuit module extension or
- heat balancing module extension or
- universal module extension

• Option of networking with up to 16 controller modules (incl. solar module)
Incl. outdoor sensor, immersion sensor (calorifier sensor), contact sensor (flow temperature sensor) and RAST 5 basic connector set

6046 330

Flow rate sensor sets
Plastic housing

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

Hoval recommendation

Recommended use	Installation site	Part. No.
twin A (17)	Inside the HP	6038 510
twin A (24,32)	Inside the HP	6042 950

Notice
With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented up to approx. -6 °C.
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.
The flow rate sensor set must be installed inside the heat pump.

Part No.

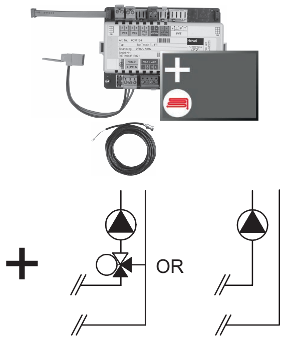
Set vibration-damping adjustable feet 35/55
for reducing the transmission
of solid-borne noise
Set comprises 4 vibration-damping
adjustable feet, threaded rot and locknut
Material elastomer part: NR, black
Material housing: galvanised steel, chromated

	Part No.
for Belaria® twin A/AR (17)	6040 346
for Belaria® twin A/AR (24)	6040 347
for Belaria® twin A/AR (32)	6040 348

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

TopTronic® E module expansions

for TopTronic® E basic module heat generator



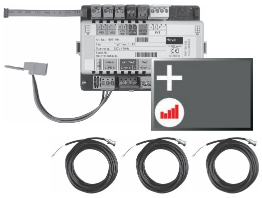
TopTronic® E module expansion heating circuit TTE-FE HK — 6034 576

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 circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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 — 6037 062

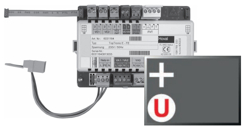
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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



TopTronic® E module expansion Universal TTE-FE UNI — 6034 575

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

incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

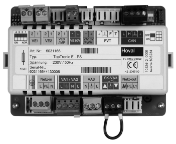
Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

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

Accessories for TopTronic® E

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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

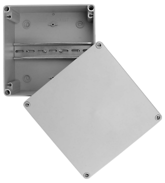
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

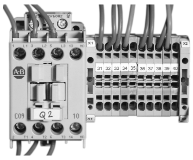
2018 837

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

Screw-in electrical heating inset
for plants with energy buffer storage tank
as emergency heating.
Control set must be ordered.

Type	Heat output [kW]	Installation depth [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4,9	620	6049 559
EP 7.5	7.5	850	6049 560



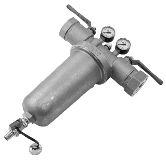
Control set (switching contactor)
for installation in the wall-hanging
electrical box.

6033 403

Necessary for the control of
an electrical heating inset.

Part No.

Accessories



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 loss.
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 Rp1″ andRp2″: Internal thread with integrated shut-off valves and union connection (outlet)
- Water temperature: max. 90 °C

Notice:
Fulfills the function of sludge separator and strainer

Type	Connection	Volume flow [m³/h] at Δp <0.1 bar pressure loss	Part No.
FGM025	Rp 1″	5.5	2076 374
FGM025	Rp 2″	7.2	2076 375

Strainers
see “Various system components”

Circulating pumps, actuators,
buffer storage tanks see separate brochures

Switching ball valve VBI60...L
DN 25-50, PN 16, 120 °C
- Three-way ball valve made of brass with threaded connection
- incl. seals and screw connections

DN	Connection	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

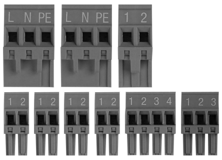
Suitable motor drive

Type	Voltage	Control signal	Actuator run time	Part No.
GLB341.9E	230 V / 50/60 Hz	2-/3-point	150 s	2070 331

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

Part No.

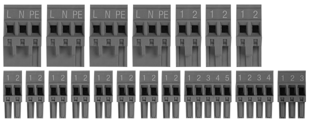
Accessories



Expansion connector set
for the automatic heat pump 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:
- 1x 230V digital input
- 2x 230V outputs
- 4x low-voltage inputs
- 1x ratio. Input

6032 509



Universal connector set
for automatic heat pump ECR461
Plugs:
- 3x 230V digital input
- 4x 230V outputs
- 6x low-voltage inputs
- 2x low-voltage outputs
- 1x ratio. input
- 1x electr. expansion valve

6032 510

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 (17-32)

Type		(17)		(24)		(32)	
		1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	4.4/3.3		4.4/3.3		4.4/3.3	
Max. performance data heating in acc. with EN 14511							
• Heat output A2W35	kW [1]	10.3	17.2	13.1	23.7	18.6	31.6
• Power consumption A2W35	kW [1]	2.2	4.2	2.9	5.8	4.1	7.9
• Coefficient of performance A2W35	COP	4.6	4.1	4.6	4.1	4.5	4.0
• Heat output A-7W35	kW [1]	8.7	14.6	11.1	20.1	15.8	26.9
• Power consumption A-7W35	kW [1]	2.3	4.3	2.9	5.9	4.2	8.0
• Coefficient of performance A-7W35	COP	3.85	3.39	3.88	3.39	3.81	3.35
• Weight	kg	430		575		590	
• Dimensions		see Dimensions					
• Compressor type		2 x spiral-(scroll), hermetic					
• Refrigerant filling R410A	kg	12.8		15.7		16.0	
• Fan type		radial/speed-controlled					
Nominal air quantity	m^3/h	3500-7000		4500-9000		5500-11000	
• Expansion valve		2 x, electronically controlled					
• Evaporator		lamellar tube Alu/Cu					
• Condenser		copper brazed stainless steel plate heat exchanger					
Heating flow and return flow	R	1¼″ (outer thread)		1½″ (outer thread)		1½″ (outer thread)	
• Heating water quantity 5k ΔT	m^3/h	3.75		5.05		6.60	
• Pressure drop heat pump	kPa	14.2		10.7		11.9	
• max. operating pressure heating side	bar	3					
• Ranges of application for heating and hot water		see diagrams					
Electrical data							
Voltage							
• Compressor	V	3 x 400					
• Fan	V	3 x 400					
Frequency	Hz	50					
Voltage range	V	380-420					
Current							
• Power consumption compressor A2/W35	kW	2.21	4.23	2.84	5.85	4.07	7.87
• Power consumption compressor A20/W55	kW	4.05	7.38	5.02	9.33	6.01	12.65
• Operating current compressor Imax.	A	7.3	14.5	9.2	18.4	12.9	25.4
• Operating current evaporator fan	A	-	1.45	-	1.45	-	1.45
• Starting current with jump start	A	22.8		29.3		39.5	
• Principal current (external protection)	A	20		25		32	
	type	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
• Control current (external protection)	A	13	13	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	B,C,D,K,Z	B,C,D,K,Z

[1] kW = incl. defrosting loss

Belaria® twin AR (17-32)

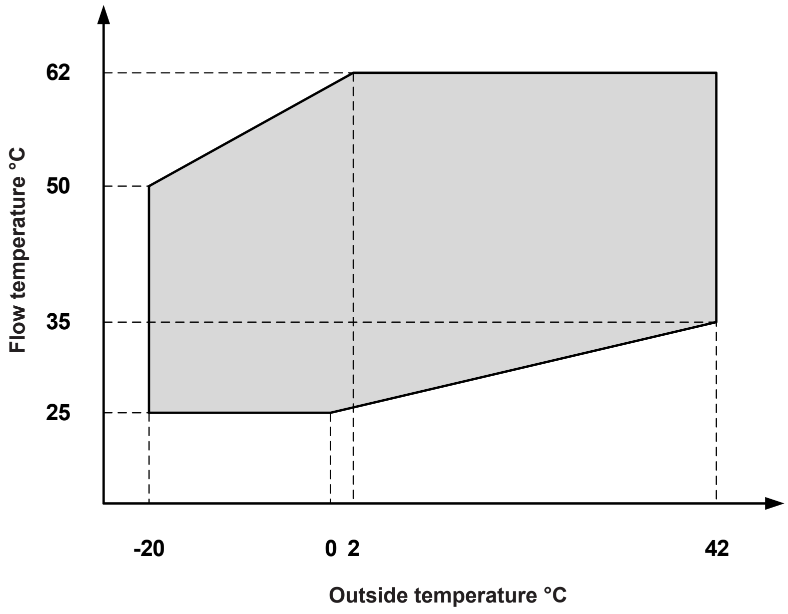
Type		(17)		(24)		(32)	
		1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Seasonal coefficient of performance moderate climate 35 °C /55 °C	SCOP	4.5/3.4		4.5/3.4		4.5/3.3	
Max. performance data heating and cooling in acc. with EN 14511							
• Heat output A2W35	kW [1]	10.3	17.2	13.1	23.7	18.6	31.6
• Power consumption A2W35	kW [1]	2.2	4.2	2.9	5.8	4.1	7.9
• Coefficient of performance A2W35	COP	4.60	4.10	4.60	4.10	4.50	4.00
• Heat output A-7W35	kW [1]	8.7	14.6	11.1	20.1	15.8	26.9
• Power consumption A-7W35	kW [1]	2.3	4.3	2.9	5.9	4.2	8.0
• Coefficient of performance A-7W35	COP	3.85	3.39	3.86	3.39	3.81	3.35
• Cooling capacity A35W18	kW	12.7	23.5	17.4	31.4	22.7	40.4
• Power consumption A35W18	kW	2.7	6.2	3.8	8.8	5.2	11.8
• Coefficient of performance A35W18	EER	4.76	3.82	4.49	3.58	4.34	3.44
• Cooling capacity A35W7	kW	9.5	17.6	12.6	22.8	16.2	28.8
• Power consumption A35W7	kW	2.6	6.0	3.6	8.2	4.7	10.6
• Coefficient of performance A35W7	EER	3.64	2.93	3.50	2.79	3.41	2.71
• Weight	kg	430		575		590	
• Dimensions		see Dimensions					
• Compressor type		2 x spiral-(scroll), hermetic					
• Refrigerant filling R410A	kg	9.7		14.6		14.8	
• Fan type		radial/speed-controlled					
Nominal air quantity	m³/h	3500-7000		4500-9000		5500-11000	
• Expansion valve		2 x, electronically controlled					
• Evaporator		lamellar tube Alu/Cu					
• Condenser		copper brazed/stainless steel plate heat exchanger					
Heating flow and return flow	R	1¼″ (outer thread)		1½″ (outer thread)		1½″ (outer thread)	
• Heating water quantity 5k ΔT	m³/h	3.75		5.05		6.60	
• Pressure drop heat pump	kPa	14.2		10.7		11.9	
• max. operating pressure heating side	bar	3					
• Ranges of application for heating, hot water and cooling		see diagrams					
Electrical data							
Voltage							
• Compressor	V	3 x 400					
• Fan	V	3 x 400					
Frequency	Hz	50					
Voltage range	V	380-420					
Current							
• Power consumption compressor A2/W35	kW	2.21	4.23	2.84	5.85	4.07	7.87
• Power consumption compressor A20/W55	kW	4.05	7.38	5.02	9.33	6.01	12.65
• Operating current compressor Imax.	A	7.3	14.5	9.2	18.4	12.9	25.4
• Operating current evaporator fan	A	-	1.45	-	1.45	-	1.45
• Starting current with jump start	A	22.8		29.3		39.5	
• Principal current (external protection)	A	20		25		32	
	type	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
• Control current (external protection)	A	13	13	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	B,C,D,K,Z	B,C,D,K,Z

[1] kW = incl. defrosting loss

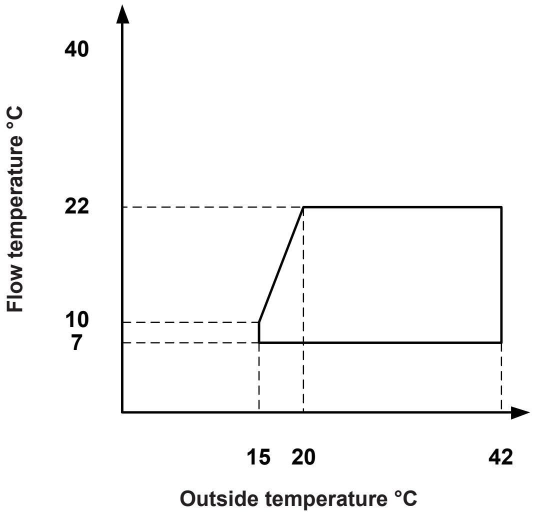
A flow controller must be installed for operational reliability in cooling mode.

Diagrams range of application

Belaria® twin A (17-32), Belaria® twin AR (17-32)
Heating and hot water



Belaria® twin AR (17-32)
Cooling



Belaria® twin A (17-32)
Belaria® twin AR (17-32)

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.

Heat pump with diffuser on the blow-out.
Entails a reduction of the sound power level of approx. 3 dB(A) depending on speed of rotation of ventilator.

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)
(17)	63	1	55	58
		5	41	44
(24)	66	1	58	61
		5	44	47
(32)	72	1	64	67
		5	50	53

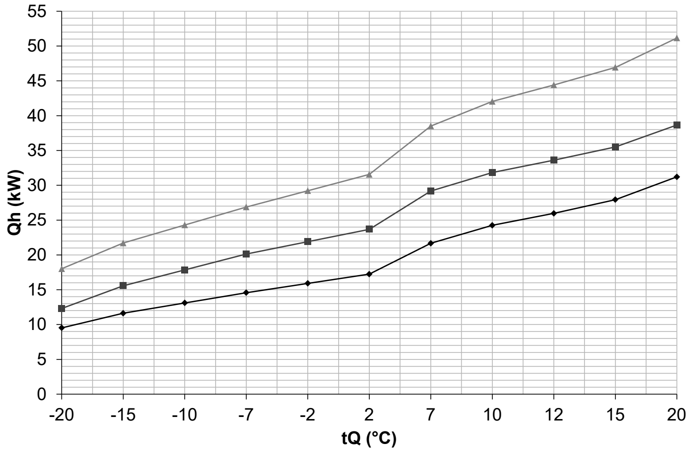
Information on sound levels applies to whisper mode. Values increase by + 4 dB(A) in normal operation

Performance data - heating

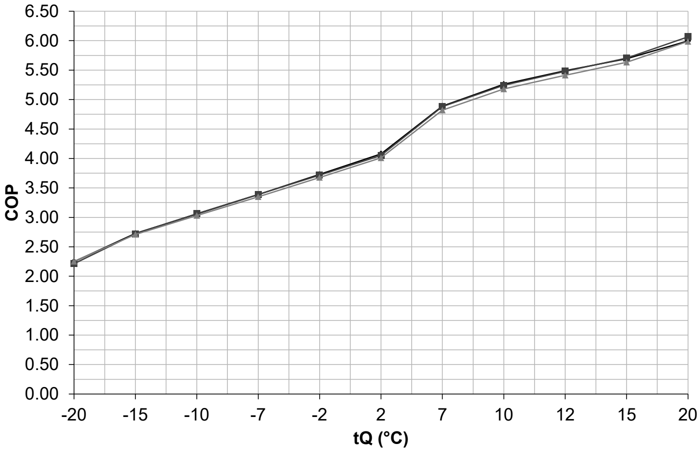
Maximum heat output allowing for defrosting losses

Belaria® twin A (17-32), twin AR (17-32)

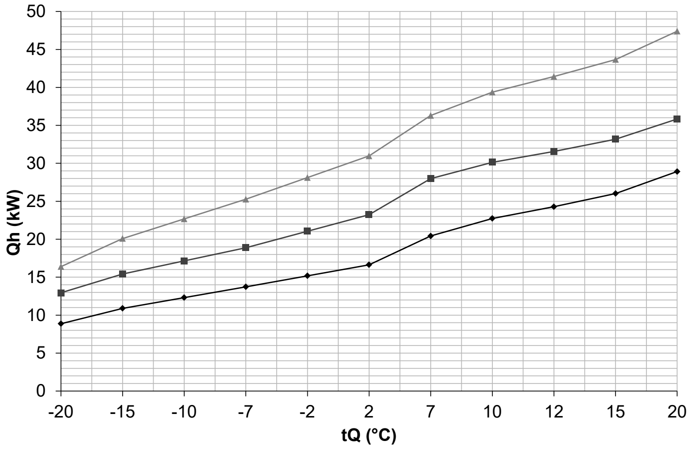
Heat output - t_{VL} 35 °C



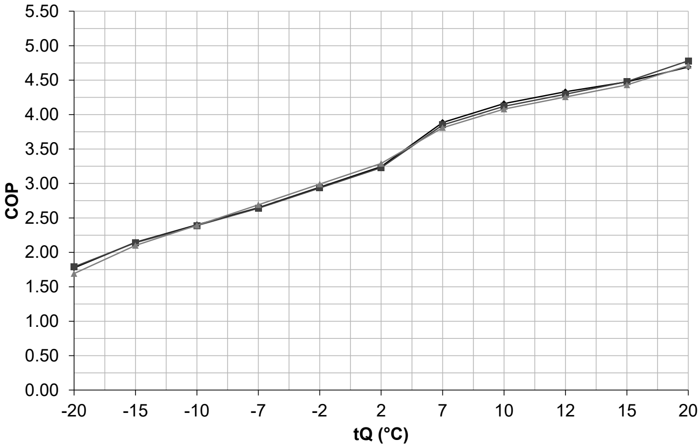
Output rating - t_{VL} 35 °C



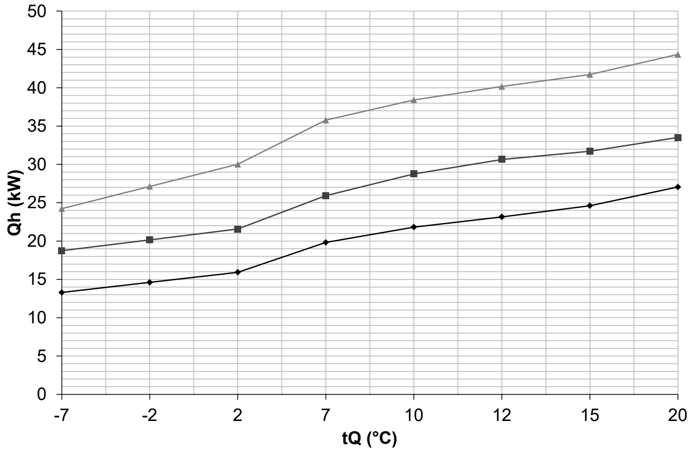
Heat output - t_{VL} 45 °C



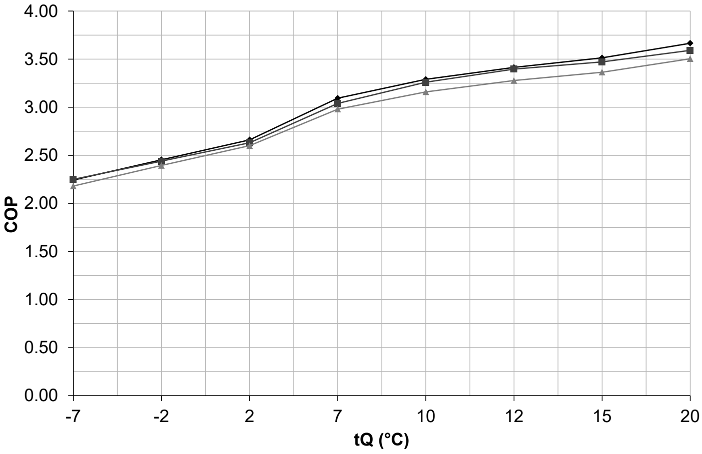
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 55 °C



Output rating - t_{VL} 55 °C



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

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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 (17)
■ Belaria® twin A/AR (24)
▲ Belaria® twin A/AR (32)

Performance data - heating

Belaria® twin A (17-32), twin AR (17-32)

Indications acc. to EN 14511

Type			(17)			(24)			(32)	
tVL °C	tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	-20	9.5	4.2	2.25	12.3	5.6	2.21	18.0	8.0	2.25
	-15	11.6	4.3	2.73	15.6	5.7	2.72	21.7	8.0	2.71
	-10	13.1	4.3	3.06	17.9	5.8	3.06	24.3	8.0	3.03
	-7	14.6	4.3	3.39	20.1	5.9	3.39	26.9	8.0	3.35
	-2	15.9	4.3	3.73	21.9	5.9	3.72	29.2	7.9	3.68
	2	17.2	4.2	4.08	23.7	5.9	4.05	31.6	7.9	4.01
	7	21.7	4.4	4.89	29.2	6.0	4.88	38.5	8.0	4.82
	10	24.3	4.6	5.26	31.8	6.1	5.24	42.0	8.1	5.18
	12	26.0	4.7	5.49	33.6	6.1	5.48	44.4	8.2	5.41
	15	27.9	4.9	5.69	35.5	6.2	5.71	46.9	8.3	5.63
	20	31.2	5.2	6.00	38.7	6.4	6.07	51.2	8.5	5.99
40	-20	9.2	4.6	1.99	12.6	6.4	1.97	17.2	8.8	1.94
	-15	11.3	4.7	2.41	15.5	6.5	2.40	20.9	8.8	2.38
	-10	12.7	4.7	2.70	17.5	6.5	2.69	23.5	8.7	2.68
	-7	14.2	4.7	2.98	19.5	6.6	2.98	26.1	8.7	2.99
	-2	15.5	4.7	3.30	21.5	6.5	3.29	28.7	8.7	3.30
	2	16.9	4.7	3.62	23.5	6.5	3.60	31.3	8.6	3.62
	7	21.0	4.8	4.35	28.6	6.6	4.32	37.4	8.8	4.27
	10	23.5	5.0	4.66	31.0	6.7	4.63	40.7	8.9	4.58
	12	25.1	5.2	4.86	32.6	6.7	4.83	42.9	9.0	4.79
	15	27.0	5.4	5.03	34.3	6.8	5.03	45.3	9.1	4.98
	20	30.1	5.7	5.29	37.1	6.9	5.34	49.2	9.3	5.28
45	-20	8.9	5.0	1.77	12.9	7.2	1.79	16.4	9.7	1.69
	-15	10.9	5.1	2.15	15.4	7.2	2.14	20.1	9.6	2.10
	-10	12.3	5.1	2.40	17.2	7.2	2.39	22.7	9.5	2.39
	-7	13.7	5.2	2.65	18.9	7.2	2.64	25.3	9.4	2.69
	-2	15.2	5.2	2.95	21.1	7.2	2.93	28.1	9.4	2.99
	2	16.6	5.1	3.25	23.2	7.2	3.23	31.0	9.4	3.29
	7	20.4	5.3	3.89	28.0	7.3	3.85	36.3	9.5	3.81
	10	22.7	5.5	4.16	30.1	7.3	4.12	39.4	9.7	4.08
	12	24.3	5.6	4.33	31.6	7.4	4.30	41.4	9.7	4.26
	15	26.0	5.8	4.47	33.2	7.4	4.48	43.7	9.9	4.43
	20	28.9	6.2	4.69	35.8	7.5	4.78	47.4	10.1	4.71
50	-20	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	13.5	5.6	2.43	18.8	7.7	2.43	24.8	10.3	2.41
	-2	14.9	5.6	2.68	20.6	7.7	2.67	27.6	10.4	2.66
	2	16.3	5.6	2.93	22.4	7.7	2.91	30.5	10.5	2.91
	7	20.1	5.8	3.45	27.0	7.9	3.42	36.0	10.8	3.35
	10	22.3	6.0	3.68	29.4	8.1	3.65	38.9	10.9	3.57
	12	23.7	6.2	3.83	31.1	8.2	3.80	40.8	11.0	3.71
	15	25.3	6.4	3.95	32.4	8.4	3.88	42.7	11.1	3.84
	20	28.0	6.8	4.13	34.7	8.7	4.00	45.9	11.4	4.04
55	-20	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	13.3	5.9	2.24	18.8	8.3	2.25	24.2	11.1	2.18
	-2	14.6	6.0	2.45	20.2	8.3	2.44	27.1	11.3	2.39
	2	15.9	6.0	2.66	21.6	8.2	2.63	30.0	11.5	2.60
	7	19.8	6.4	3.09	25.9	8.5	3.04	35.8	12.0	2.98
	10	21.8	6.6	3.29	28.8	8.8	3.26	38.4	12.2	3.16
	12	23.2	6.8	3.41	30.6	9.0	3.40	40.2	12.3	3.28
	15	24.6	7.0	3.51	31.7	9.1	3.47	41.7	12.4	3.36
	20	27.1	7.4	3.67	33.5	9.3	3.59	44.3	12.7	3.50
60	-20	-	-	-	-	-	-	-	-	-
	-15	-	-	-	-	-	-	-	-	-
	-10	-	-	-	-	-	-	-	-	-
	-7	-	-	-	-	-	-	-	-	-
	-2	-	-	-	-	-	-	-	-	-
	2	15.5	7.1	2.18	20.5	9.6	2.13	29.4	14.1	2.08
	7	19.4	7.6	2.56	25.0	10.0	2.51	35.4	14.5	2.44
	10	21.2	7.7	2.74	27.8	10.3	2.70	38.0	14.5	2.62
	12	22.4	7.8	2.86	29.6	10.5	2.82	39.7	14.5	2.74
	15	23.7	8.0	2.96	30.5	10.6	2.87	40.7	14.5	2.82
	20	25.8	8.3	3.13	32.0	10.8	2.96	42.4	14.4	2.94

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

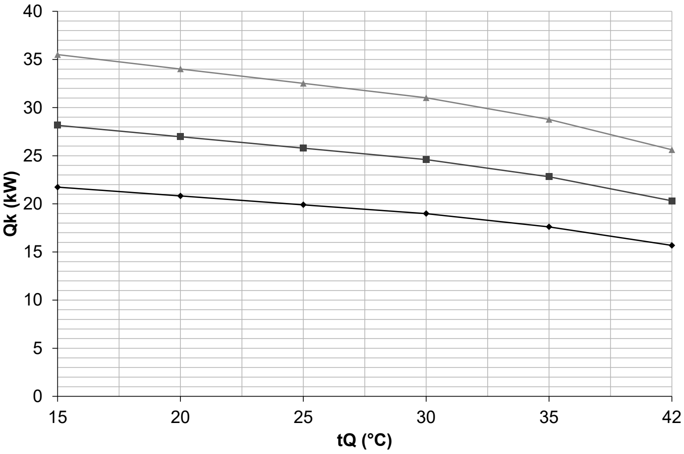
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - cooling

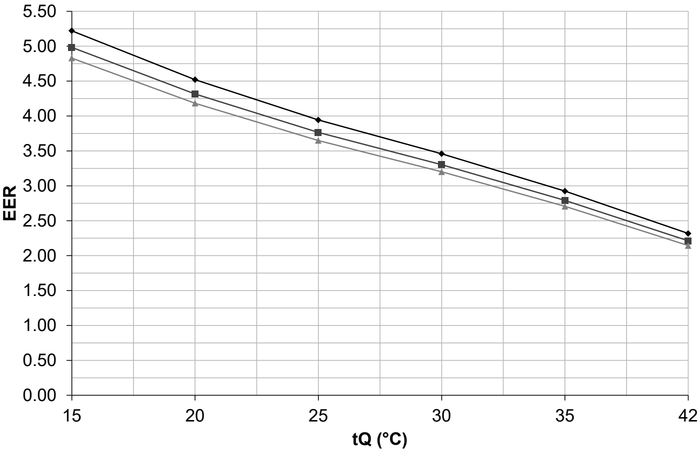
Maximum cooling capacity

Belaria® twin AR (17-32)

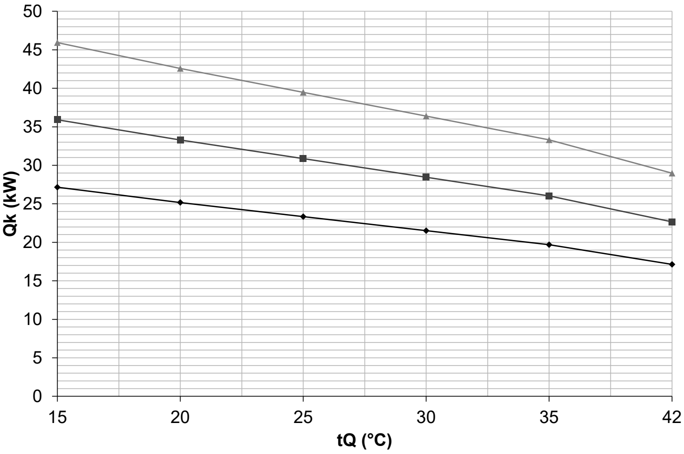
Cooling capacity - t_{VL} 7 °C



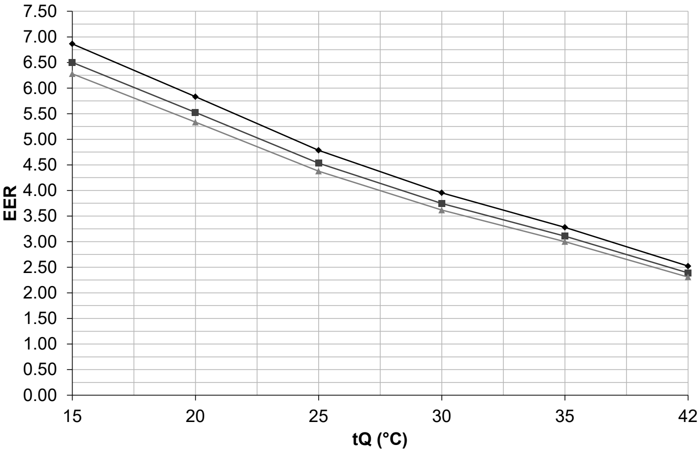
Output rating - t_{VL} 7 °C



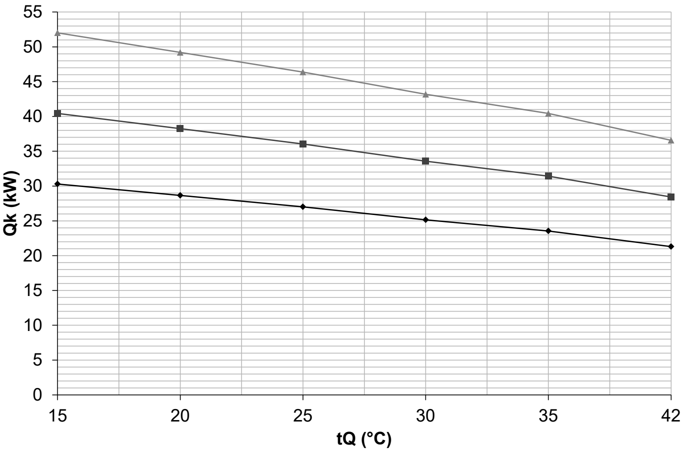
Cooling capacity - t_{VL} 13 °C



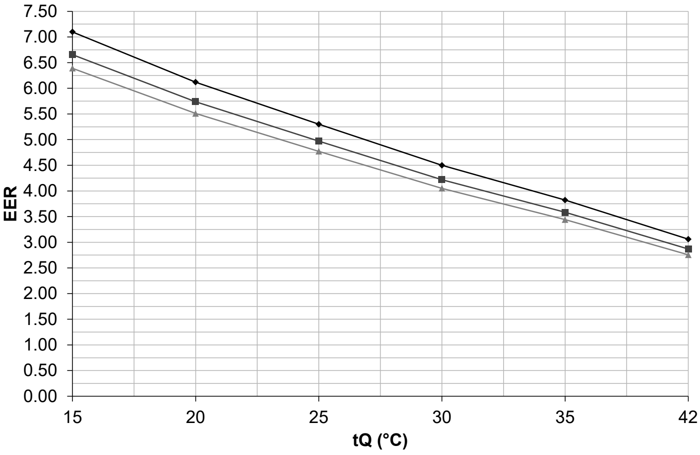
Output rating - t_{VL} 13 °C



Cooling capacity - t_{VL} 18 °C



Output rating - t_{VL} 18 °C



tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
EER = Coefficient of Performance for the overall unit in accordance with standard EN 14511

◆ Belaria® twin AR (17)
■ Belaria® twin AR (24)
▲ Belaria® twin AR (32)

Performance data - cooling

Belaria® twin AR (17-32)

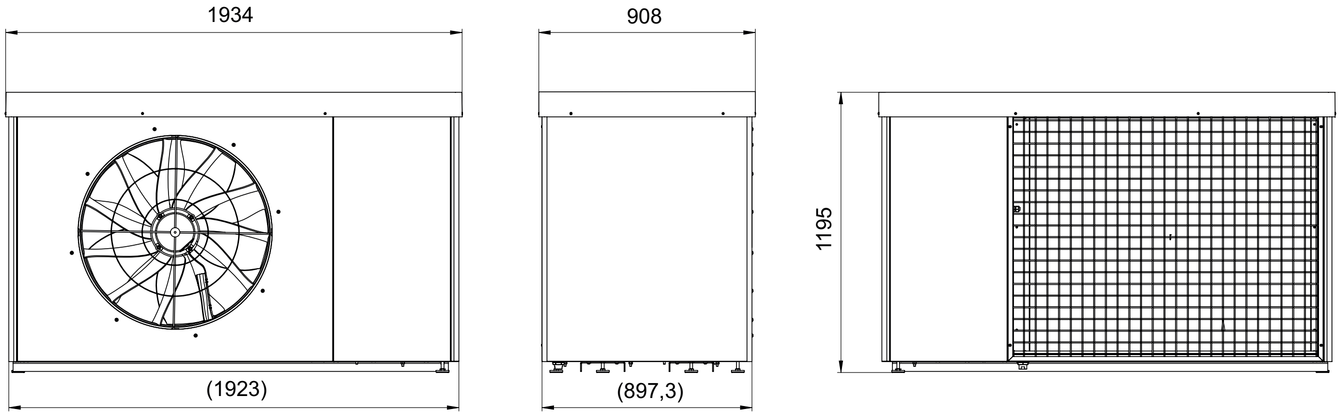
Indications acc. to EN14511

Type			(17)			(24)			(32)	
tVL °C	**tQ °C**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**	**Qk kW**	**P kW**	**EER**
7	15	21.7	4.2	5.22	28.2	5.6	4.98	35.5	7.4	4.83
	20	20.8	4.6	4.52	27.0	6.2	4.32	34.0	8.1	4.18
	25	19.9	5.0	3.94	25.8	6.8	3.77	32.5	8.9	3.65
	30	19.0	5.5	3.46	24.6	7.4	3.30	31.0	9.7	3.20
	35	17.6	6.0	2.93	22.8	8.2	2.79	28.8	10.6	2.71
	42	15.7	6.8	2.32	20.3	9.2	2.21	25.6	11.9	2.14
10	15	25.1	3.7	6.77	33.1	5.2	6.42	42.3	6.8	6.20
	20	23.5	4.3	5.51	31.0	5.9	5.23	39.6	7.8	5.05
	25	22.0	4.8	4.55	28.9	6.7	4.32	36.9	8.9	4.17
	30	20.4	5.4	3.79	26.9	7.5	3.59	34.3	9.9	3.47
	35	18.8	5.9	3.16	24.8	8.3	3.00	31.6	10.9	2.90
	42	16.6	6.7	2.47	21.8	9.3	2.34	27.9	12.3	2.26
13	15	26.4	4.0	6.86	35.0	5.4	6.50	44.7	7.2	6.25
	20	25.2	4.3	5.83	33.3	6.0	5.52	42.6	8.0	5.33
	25	23.3	4.9	4.78	30.9	6.8	4.53	39.5	9.0	4.38
	30	21.5	5.4	3.95	28.5	7.6	3.75	36.4	10.1	3.62
	35	19.7	6.0	3.28	26.0	8.4	3.11	33.3	11.1	3.00
	42	17.1	6.8	2.52	22.7	9.5	2.39	29.0	12.6	2.31
15	15	28.4	4.1	7.0	37.7	5.8	6.60	48.4	7.6	6.33
	20	27.0	4.5	6.03	35.5	6.3	5.64	45.2	8.4	5.41
	25	25.2	5.0	5.06	33.2	7.0	4.74	42.2	9.3	4.54
	30	23.3	5.5	4.23	30.7	7.7	3.96	39.1	10.3	3.80
	35	21.6	6.1	3.55	28.4	8.5	3.32	36.2	11.4	3.18
	42	19.6	6.8	2.87	25.8	9.6	2.68	32.9	12.8	2.57
18	15	30.3	4.3	7.10	40.4	6.1	6.66	52.0	8.1	6.39
	20	28.7	4.7	6.12	38.2	6.7	5.74	49.2	8.9	5.51
	25	27.0	5.1	5.30	36.1	7.3	4.97	46.4	9.7	4.77
	30	25.2	5.6	4.50	33.6	8.0	4.22	43.2	10.7	4.05
	35	23.5	6.2	3.82	31.4	8.8	3.58	40.4	11.8	3.44
	42	21.3	7.0	3.06	28.4	9.9	2.87	36.6	13.3	2.76
20	15	30.5	4.2	7.32	41.7	6.0	6.91	54.5	8.2	6.67
	20	29.2	4.7	6.26	39.6	6.7	5.90	51.6	9.1	5.68
	25	27.8	5.2	5.40	37.6	7.4	5.07	48.7	10.0	4.88
	30	26.5	5.6	4.69	35.5	8.1	4.39	45.9	10.9	4.21
	35	25.1	6.1	4.10	33.2	8.8	3.77	42.5	11.9	3.57
	42	23.2	6.8	3.41	30.6	9.7	3.14	39.0	13.1	2.98
22	15	33.2	4.2	7.85	44.3	6.1	7.28	56.9	8.2	6.94
	20	31.5	4.8	6.62	42.0	6.8	6.14	54.0	9.2	5.85
	25	29.8	5.3	5.63	39.7	7.6	5.22	51.1	10.3	4.98
	30	28.1	5.7	4.91	37.5	8.2	4.55	48.2	11.1	4.34
	35	26.0	6.2	4.18	34.6	8.9	3.88	44.5	12.0	3.70
	42	24.1	6.9	3.52	32.2	9.9	3.27	41.4	13.3	3.12

tVL = cooling water flow temperature (°C)
tQ = source temperature (°C)
Qk = cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW)
EER = Energy Efficiency Rate for the overall unit in accordance with standard EN 14511

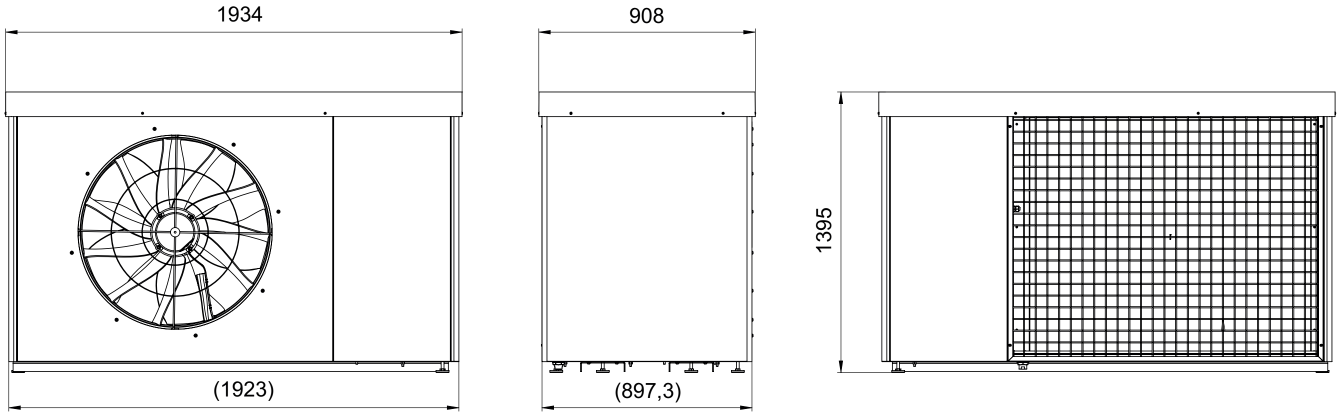
Belaria® twin A (17), Belaria® twin AR (17)

(Dimensions in mm)



Belaria® twin A (24,32), Belaria® twin AR (24,32)

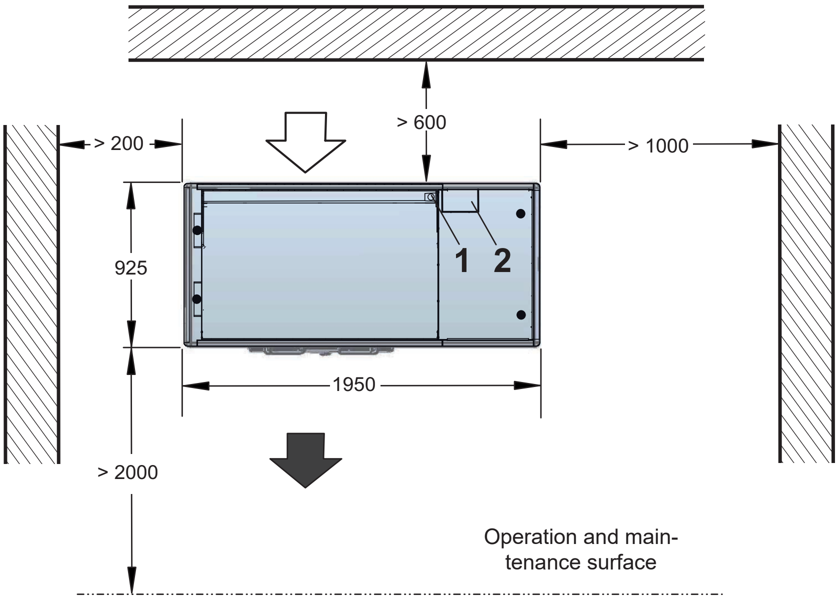
(Dimensions in mm)



Space requirement

(Dimensions in mm)

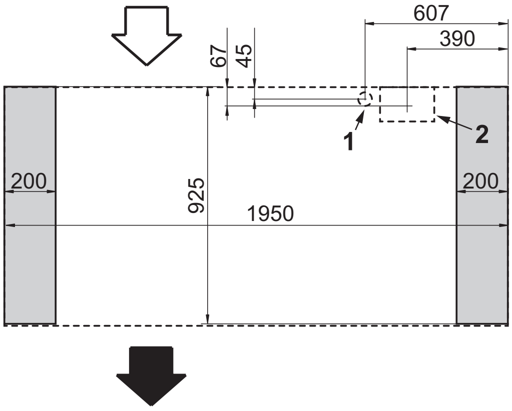
Belaria® twin A (17-32), Belaria® twin AR (17-32)



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

Base plan Belaria® twin A (17-32), Belaria® twin AR (17-32)

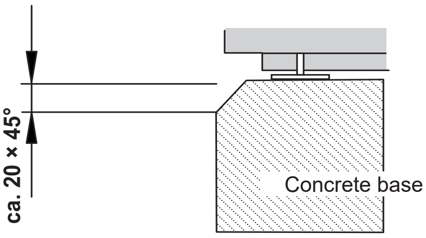
(Dimensions in mm)



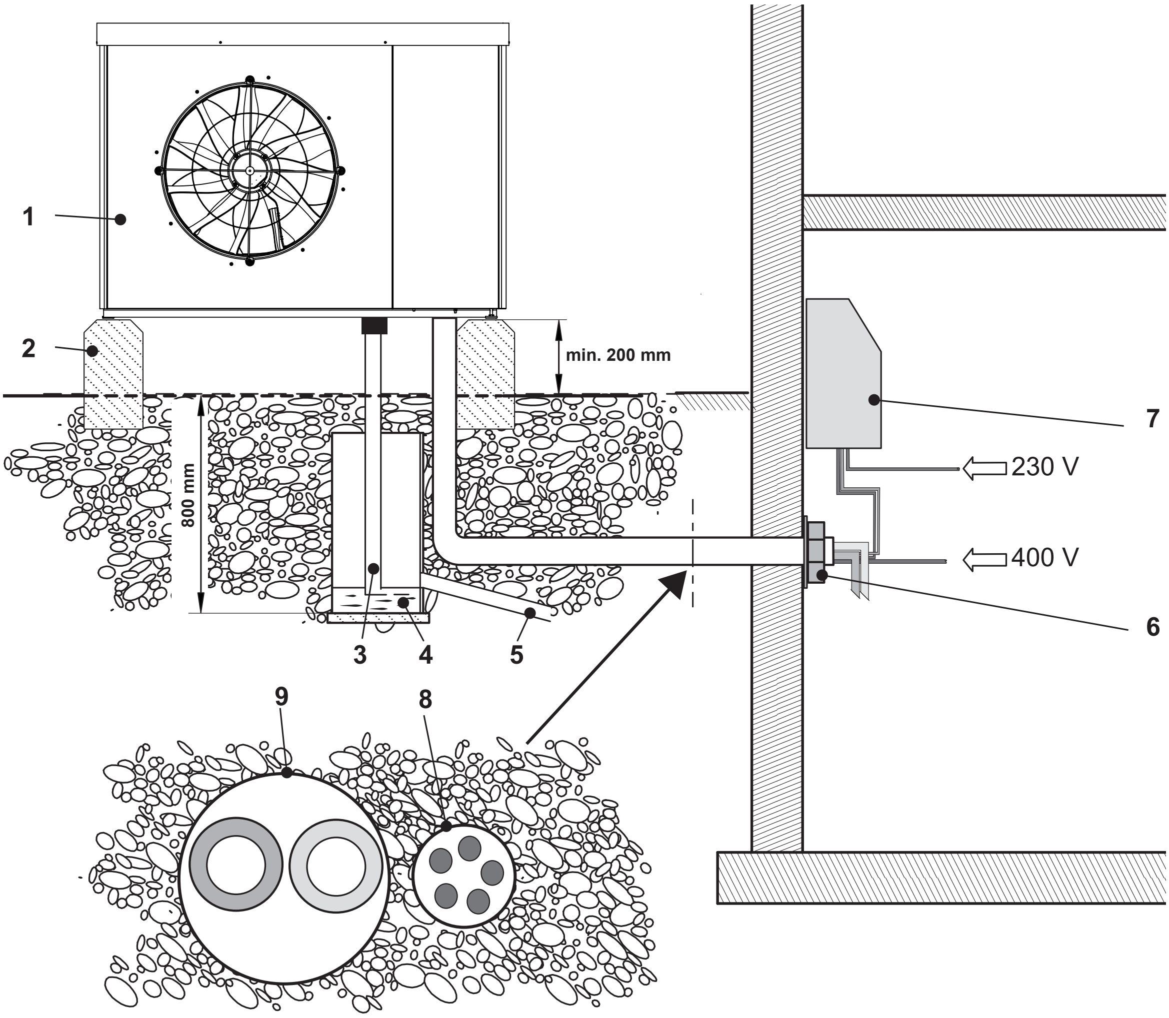
1 Condensate drain (Rp 1″) with electric trace heating
2 Hydraulic and electrical connection

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 (17-32), Belaria® twin AR (17-32)



1 Belaria® twin A (17-32)/Belaria® twin AR (17-32)
2 Concrete base
3 Condensate drain (R 1″) with electr. auxiliary heating (on site)
4 Possible variant with duct diameter / gravel bed
5 Discharge into the sewer 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-pole/configuration cross section on site
	Control current	230 V/3-pole/configuration cross section on site
	Bus line	24 V/2-pole/2 x 1.0 mm² shielded
	Pump control CP	24 V/2-pole/2 x 1.0 mm² shielded
1 cable 10 x 1.5 mm²	Fault contact CP	230 V/2-pole/2 x 1.5 mm²
	Lock by energy supply company	230 V/2-pole/2 x 1,5 mm²
	Reset	230 V/1-pole/1 x 1.5 mm²
	Heat generator block	230 V/1-pole/1 x 1.5 mm²
	Collective fault	230 V/2-pole/2 x 1.5 mm²
	Electric inset	230 V/1-pole/1 x 1.5 mm²

Options

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

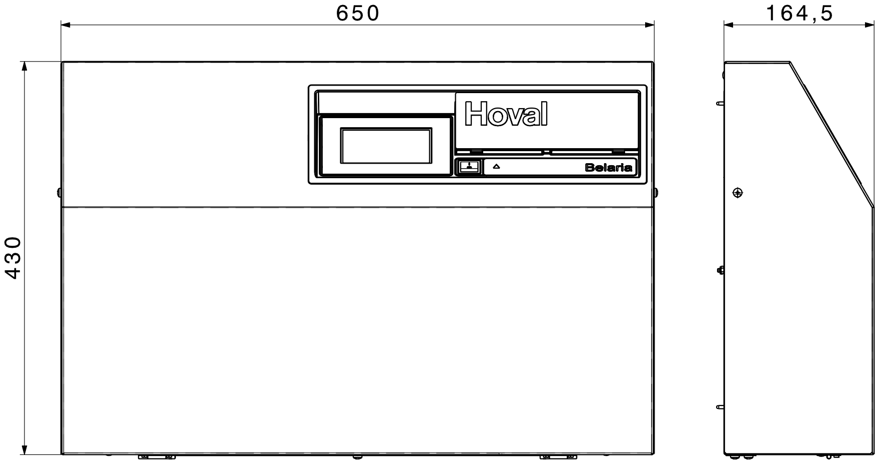
9 Empty tube for hydraulic connections outdoor unit

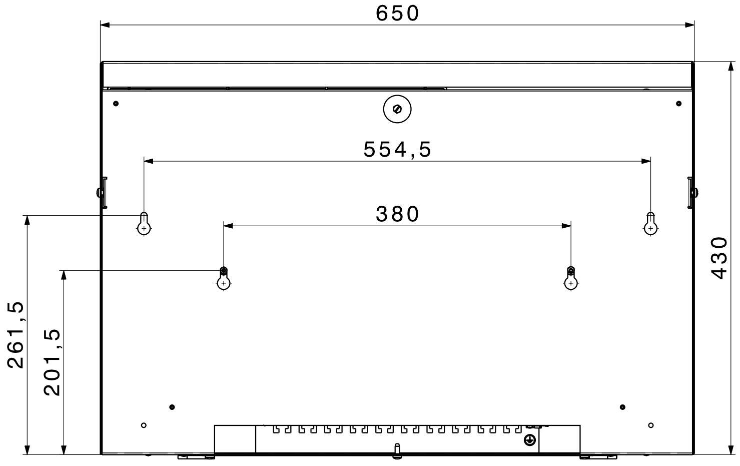
Heating flow	(17) R 1¼″/(24,32) R 1½″
Heating return	(17) R 1¼″/(24,32) R 1½″

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 (17-32), Belaria® twin AR (17-32)

(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)
- Refrigerant interim injection. This permits flow temperatures from 65 °C up to an outdoor temperature of -20 °C
- 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.

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)

Seal of approval FWS
The Belaria® dual AR (60) series are certified by the seal of approval of the authorisation commission of Switzerland.

Model range

Belaria® dual AR Type	35 °C	55 °C	Refrigerant	Max. flow °C	Heat output A2W35 Stage 1	 Stage 2 kW	Cooling capacity A35W7 Stage 1	 Stage 2 kW
(60)	A++	A+	2x R410A	65	25.1	50.3	24.6	49.2

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 DHW charging circuit
  - Bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast5 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”

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)

Options

- Diffuser for sound reduction

Delivery

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

Recommended accessories

- Continuous, speed-controlled high-efficiency pump

Part No.

Air/water heat pump - 2-stage

Hoval Belaria® dual AR

Air/water heat pump with cooling function for outdoor installation without electrical box.

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

Belaria® dual AR Type	Heat output for A2W35 Stage 1 kW	 Stage 2	Cooling capacity for A35W7 Stage 1 kW	 Stage 2	Part No.
(60)	25.1	50.3	24.6	49.2	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
An energy buffer accumulator must be provided.

Matching energy 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.

Part No.

Accessories

Electrical box
for wall installation in building interiors with built-in Hoval TopTronic® E controller
Integrated control functions for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer
- 1 DHW charging circuit
- Bivalent and cascade management
- Option of extending by max. 1 module extension:
  - heating circuit module extension or
  - heat balancing module extension or
  - universal module extension
- Option of networking with up to 16 controller modules (incl. solar module)

Incl. outdoor sensor, immersion sensor (calorifier sensor), contact sensor (flow temperature sensor) and RAST 5 basic connector set

6046 330

Flow rate sensor sets
Plastic housing

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

Hoval recommendation

Recommended use	Installation site	Part. No.
dual AR (60)	Inside the HP	6042 950

Notice
With the help of flow rate sensors and further technical measures, the heating circuit freezing can be prevented up to approx. -6 °C.
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. The flow rate sensor set must be installed inside the heat pump.

Part No.

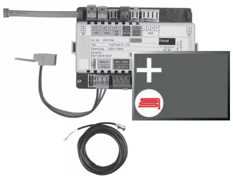
Set vibration-damping adjustable feet 55/65
for Belaria® dual AR (60)
for reducing the transmission
of solid-borne noise
Set comprises 4 vibration
damping feet, threaded rod
and lock nut
Material elastomer part: NR, black
Material housing: galvanised steel,
chromated

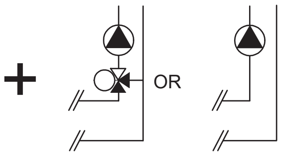
6040 854

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

TopTronic® E module expansions

for TopTronic® E basic module heat generator





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

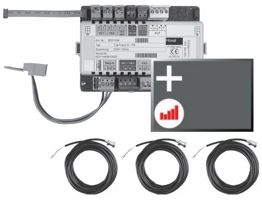
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

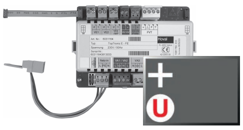
in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

6034 575

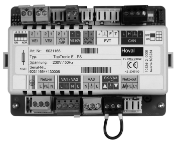
Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

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

Accessories for TopTronic® E

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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

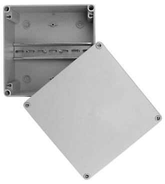
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

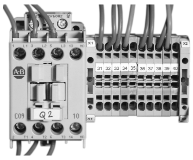
2018 837

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

Screw-in electrical heating inset
for plants with energy buffer storage tank
as emergency heating.
Control set must be ordered.

Type	Heat output [kW]	Installation depth [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.6	620	6049 559
EP 7.5	7.5	850	6049 560



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

6033 403

Necessary for the control
of an electrical heating inset.

System water protection filter
Type: 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 loss.
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 Rp2″:
Internal thread with integrated
shut-off valves and union connection
(outlet)
Max. flow rate: (∆p<0.1 bar): 7.2 m³/h
Weight: 6.9 kg
Water temperature: max. 90 °C

2076 375

Notice:
Fulfills the function of sludge separator and strainer

Further strainers
see “Various system components”

Part No.

Accessories

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

- Three-way ball valve made of brass with threaded connection
- incl. seals and screw connections

DN	Connection	kvs m³/h	Part No.
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Suitable motor drive

Type	Voltage	Control signal	Actuator run time	Part No.
GLB341.9E	230 V / 50/60 Hz	2-/3-point	150 s	2070 331

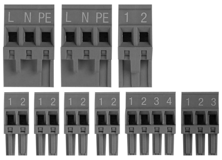
Floating cone flow controller 2064 164

Operating range
3000–30,000 l/h, 0–80 °C
Nominal pressure 10 bar
DN 65 connection
Installation length 335 mm
Bistable Reed contact
Contact open without flow

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

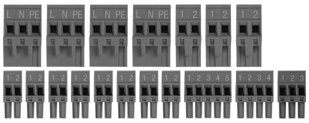
Part No.

Accessories



Expansion connector set
for the automatic heat pump 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:
- 1x 230V digital input
- 2x 230V outputs
- 4x low-voltage inputs
- 1x ratio. Input

6032 509



Universal connector set
for automatic heat pump ECR461
Plugs:
- 3x 230V digital input
- 4x 230V outputs
- 6x low-voltage inputs
- 2x low-voltage outputs
- 1x ratio. input
- 1x electr. expansion valve

6032 510

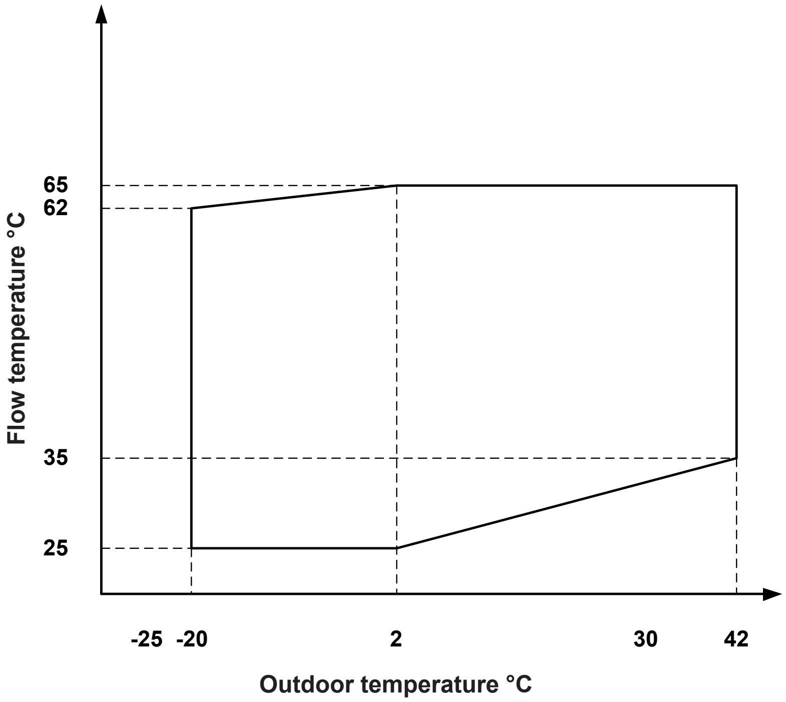
Belaria® dual AR (60)

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
• Power consumption A2W35	kW	13.8
• Coefficient of performance A2W35	COP	3.6
• Heat output A-7W35	kW	45.5
• Power consumption A-7W35	kW	14.6
• Coefficient of performance A-7W35	COP	3.1
• Cooling capacity A35W18	kW	70.5
• Power consumption A35W18	kW	21.3
• Coefficient of performancel A35W18	EER	3.3
• Cooling capacity A35W7	kW	49.2
• Power consumption A35W7	kW	20.9
• Coefficient of performance A35W7	EER	2.4
Sound data		
• Sound power level at full load [1]	dB (A)	67.0
• Sound pressure level at 5 m (on facade) [1]	dB (A)	48.0
• Sound pressure level at 10 m (on facade) [1]	dB (A)	42.0
• Sound power level at partial load [1]	dB (A)	66.0
• Sound pressure level at 5 m (on facade) [1]	dB (A)	47.0
• Sound pressure level at 10 m (on facade) [1]	dB (A)	41.0
Hydraulic data		
• Maximum flow temperature	°C	65
• Nominal flow rate heating water 5K ΔT	m^3/h	12.9
• Nominal flow rate heating water 8K ΔT	m^3/h	7.3
• Condenser pressure drop at nominal flow rate	kPa	6.0
• Max. operating pressure on the heating side	bar	3
• Flow/return connection heating	R	2" external thread
• Built-in condensate drain	R	2" external thread
• Built-in fan		2 x owl-wing axial fan
• Nominal air quantity	m^3/h	2 x 11,000
• 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	2x 1.45
• Fan power consumption (total)	W	2x 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	1439 x 3272 x 895
• Weight	kg	880

[1] The sound power levels apply in whisper mode.
The values increase by +6 dB(A) in full-load operation or +4 dB(A) in partial load operation.

Graphs of operating range

Heating and how water



Cooling

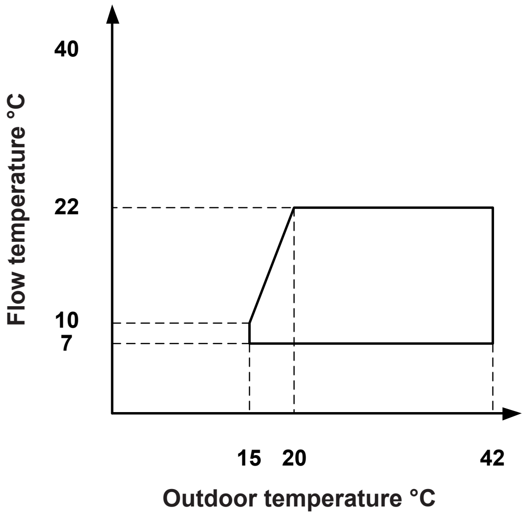
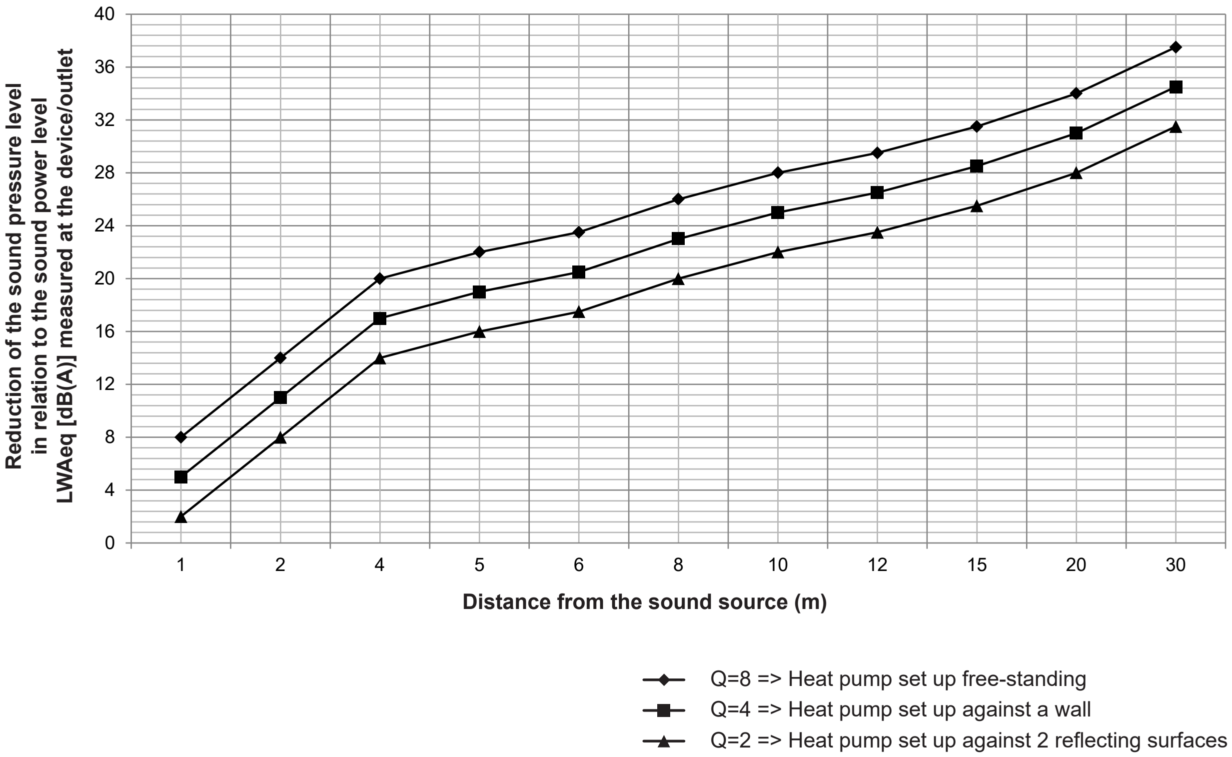


Diagram for rough calculation of the sound pressure level



Example 1:

The sound pressure level of the **Belaria® dual AR (60)** should be measured at a distance of **5 m** if it is installed on a facade.

Sound power level	-	Sound pressure level reduction (5 m)	=	Sound pressure level (5 m)
67.0 dB(A) 1)	-	19 dB(A)	=	48.0 dB(A) 1)

The sound pressure level of the **Belaria® dual AR (60)** should be measured at a distance of **10 m** if it is installed on a facade.

Sound power level	-	Sound pressure level reduction (10 m)	=	Sound pressure level (10 m)
67.0 dB(A) 1)	-	25 dB(A)	=	42.0 dB(A) 1)

1) The sound power levels apply in whisper mode.
The values increase by +6 dB(A) in full-load operation or +4 dB(A) in partial load operation.

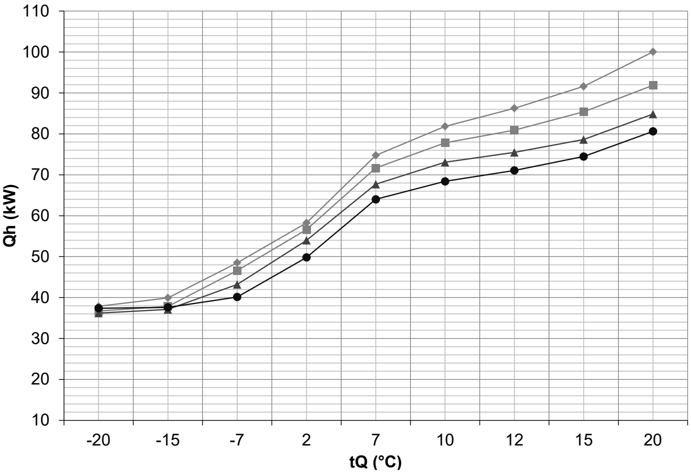
Performance data – heating

Maximum heat output allowing for defrosting losses

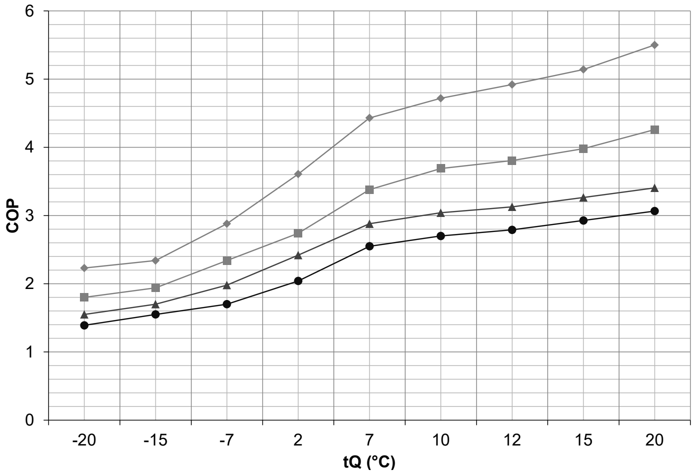
Belaria® dual AR (60)

Full load (2-stage)

Heat output

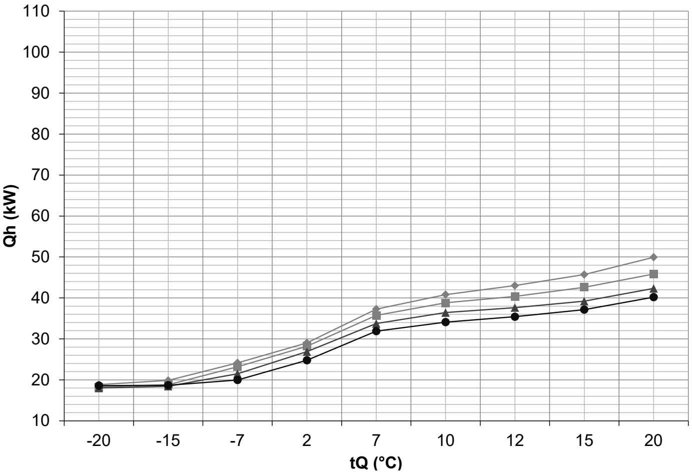


Coefficient of performance

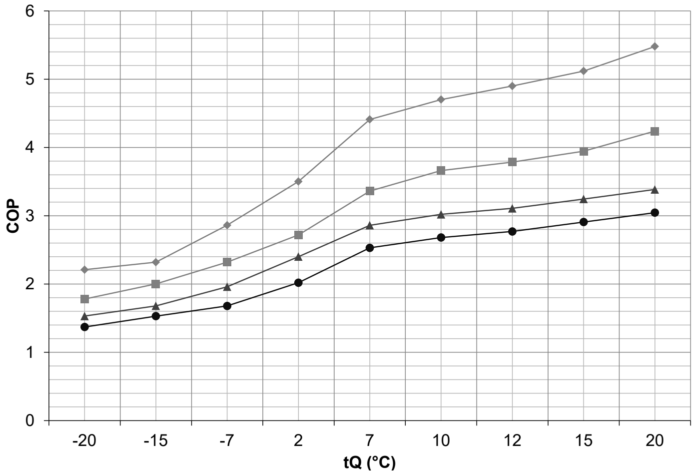


Partial load (1-stage)

Heat output



Coefficient of performance



tQ = Source temperature (°C)
Qh = 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 tFL °C	tQ °C	Qh kW	(60) Stage 1 P kW	COP	Qh kW	(60) Stage 2 P kW	COP
35	-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
	-7	22.7	7.3	3.1	45.5	14.6	3.1
	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
45	-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
	-7	22.4	8.8	2.6	45.0	17.5	2.6
	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
55	-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
	-7	22.2	10.2	2.2	44.5	20.4	2.2
	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
62	-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
	-7	20.6	11.1	1.9	41.4	22.0	1.9
	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

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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

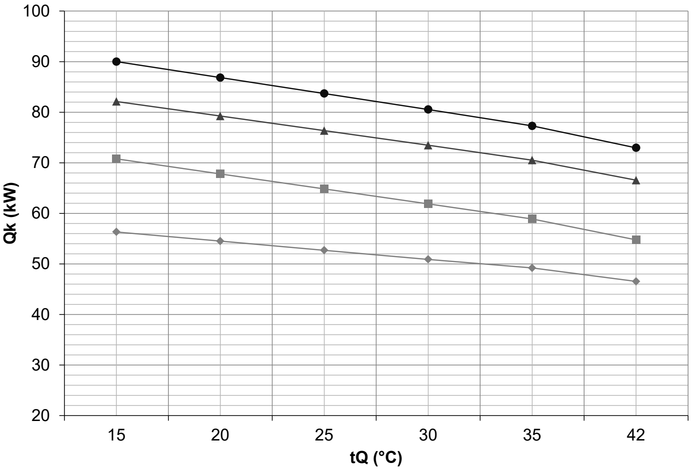
Performance data – cooling

Maximum cooling capacity

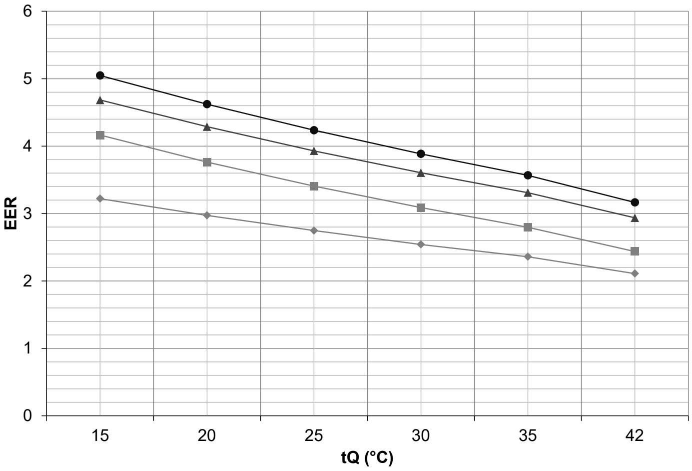
Belaria® dual AR (60)

Full load

Cooling capacity

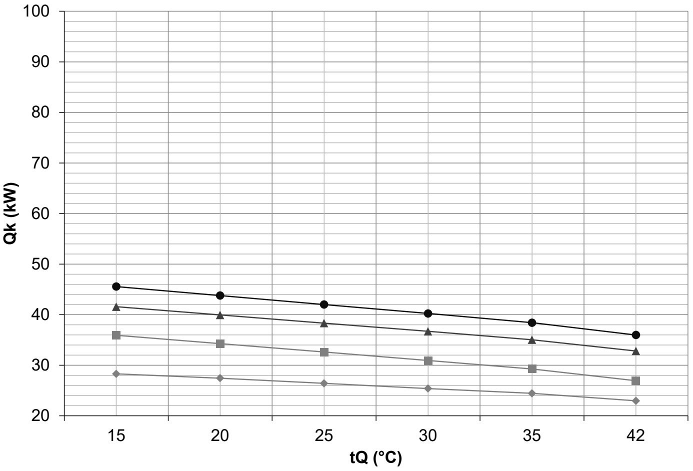


Coefficient of performance

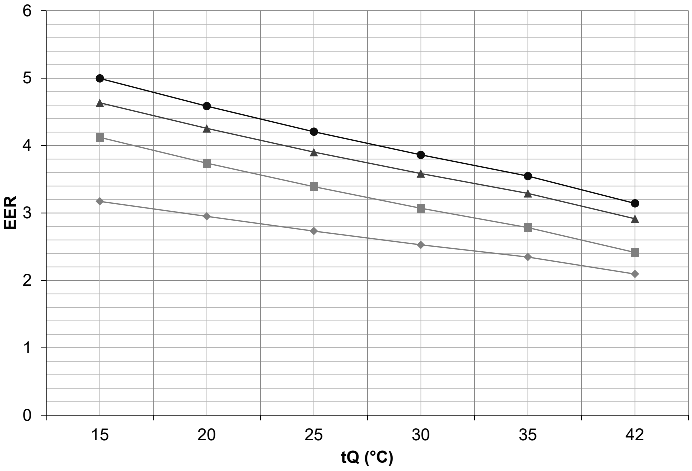


Partial load

Cooling capacity



Coefficient of performance



tQ = Source temperature (°C)
Qk = Cooling capacity at full load (kW), measured in accordance with standard EN 14511
EER = Energy efficient rate 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

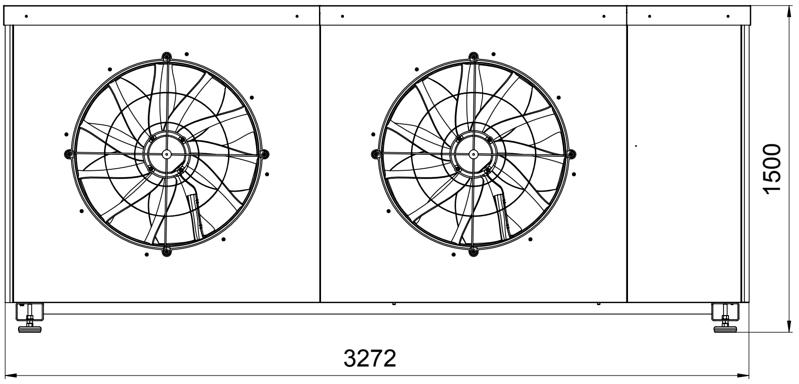
Type tFL °C	tQ °C	(60) Stage 1 Qk kW	P kW	EER	(60) Stage 2 Qk kW	P kW	EER
7	15	28.3	8.9	3.2	56.3	17.5	3.2
	20	27.4	9.3	3.0	54.5	18.3	3.0
	25	26.4	9.7	2.7	52.7	19.2	2.7
	30	25.4	10.1	2.5	50.9	20.0	2.5
	35	24.5	10.4	2.3	49.2	20.9	2.4
	42	23.0	11.0	2.1	46.5	22.1	2.1
10	15	33.0	8.8	3.7	65.0	17.2	3.8
	20	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

tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity at full load (kW), measured in accordance with standard EN 14511
P = Power consumption for the overall unit (kW)
EER = Energy efficient rate for the overall unit in accordance with standard EN 14511

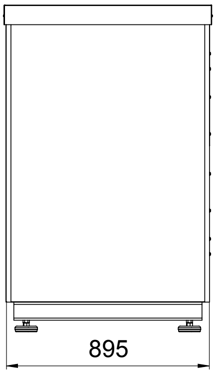
Belaria® dual AR (60)

(Dimensions in mm)

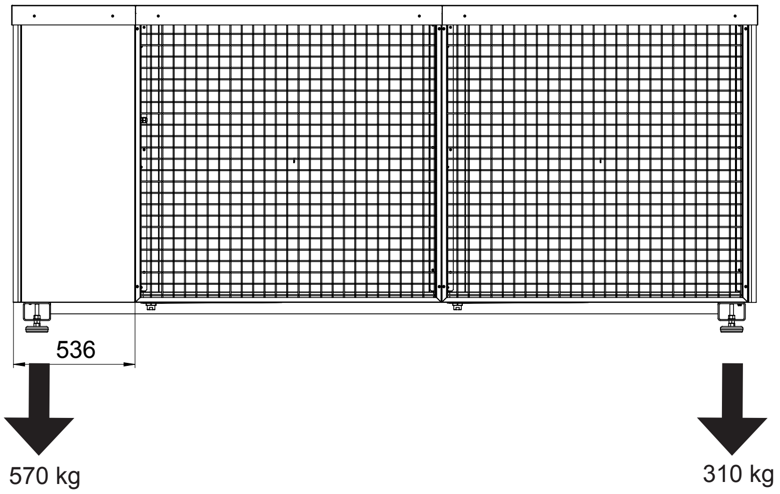
Front view (exhaust side)



Page view

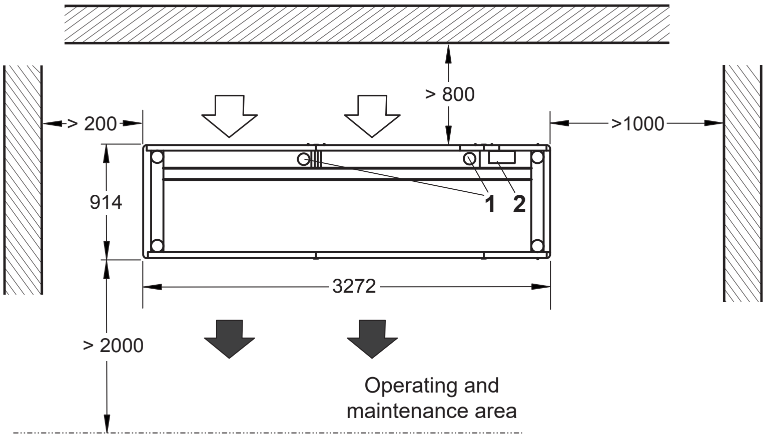


Rear (suction side)



Space requirement

(Dimensions in mm)

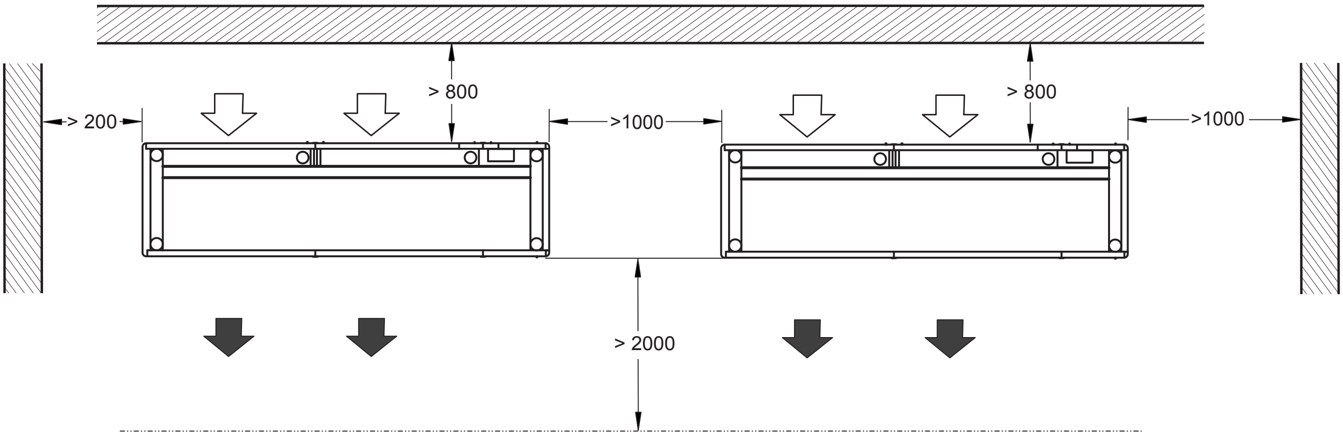


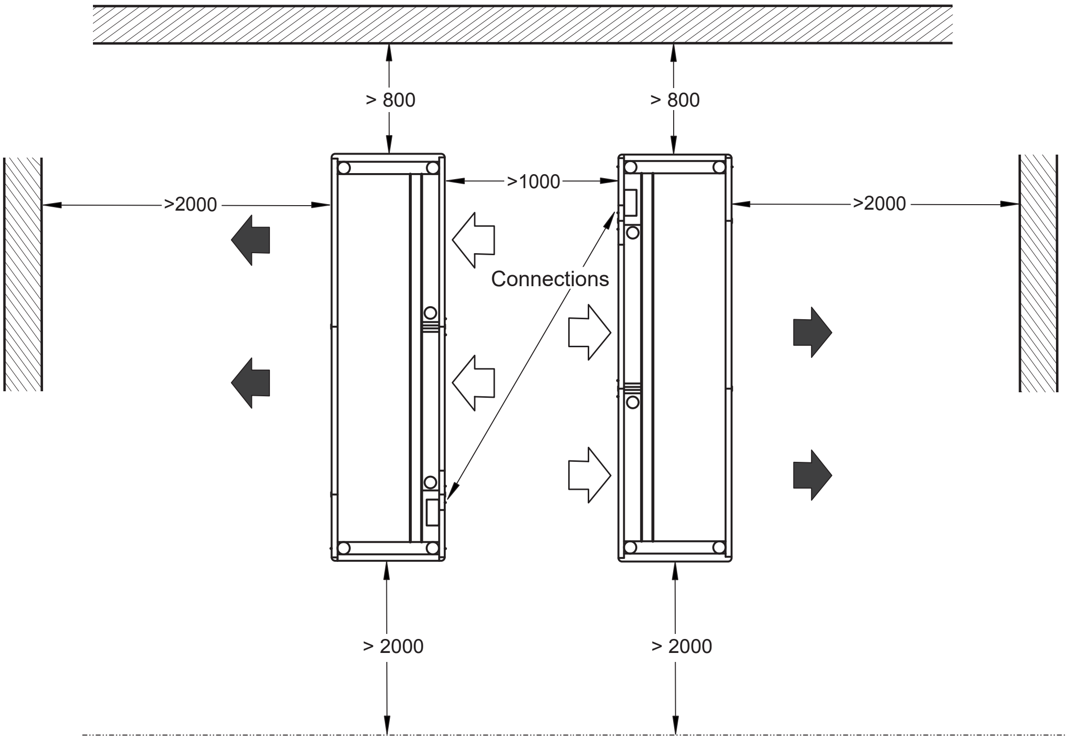
1 Condensate drain with elec. auxiliary heating
2 Hydraulic and electrical connection

Foot Ø 100 mm

Minimum distances for cascade systems

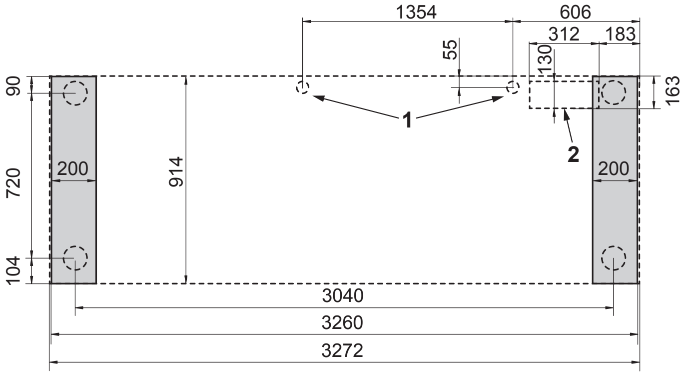
(Dimensions in mm)





Base design

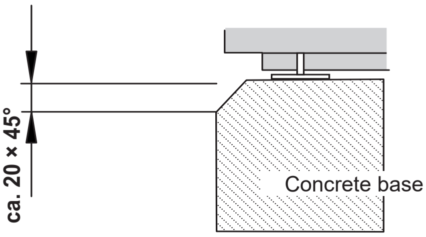
(Dimensions in mm)



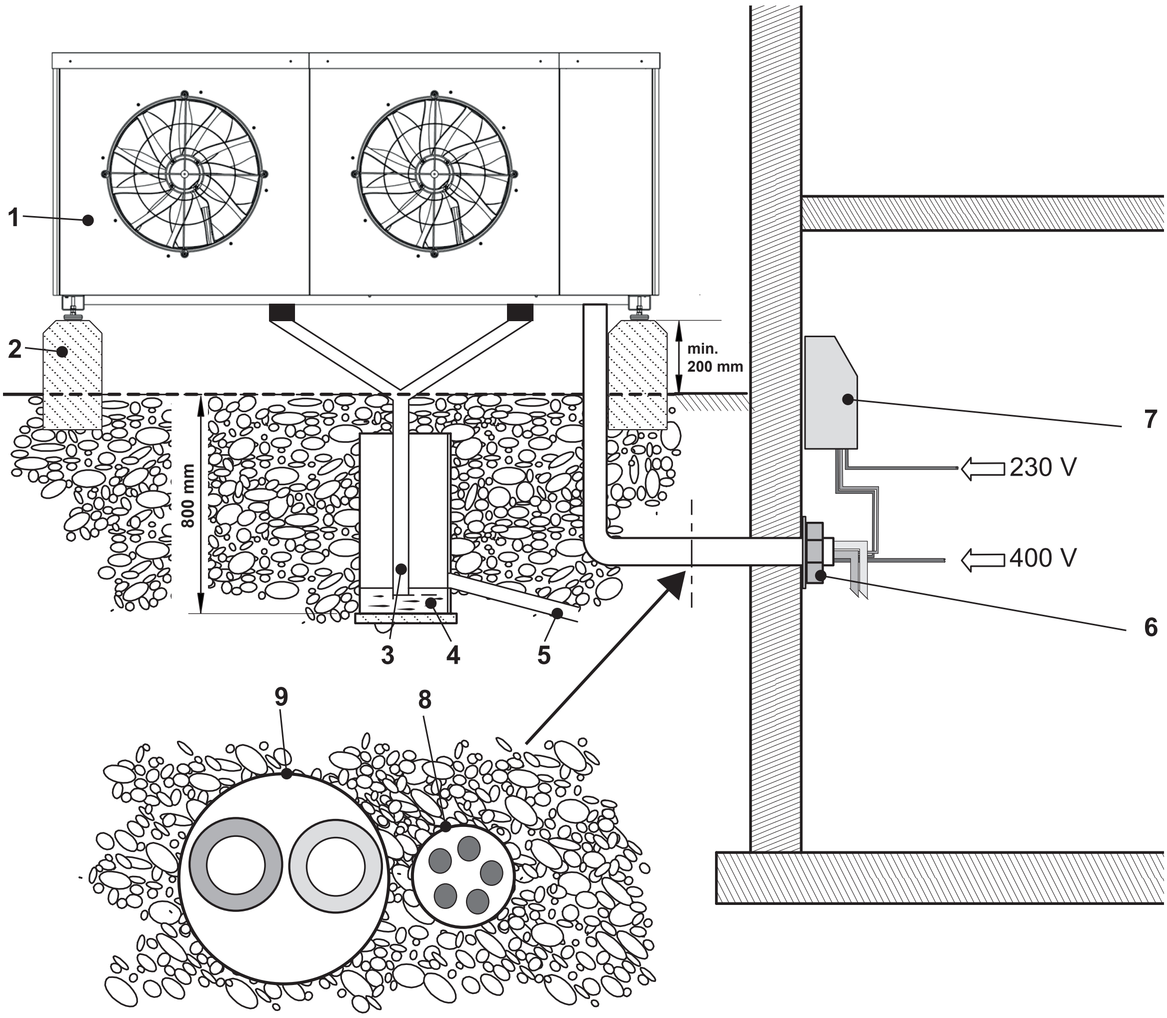
1 Condensate drain with elec. auxiliary heating
2 Hydraulic and electrical connection

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

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



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



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

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 sewer 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-pole/configuration cross section on site
	Control current	230 V/3-pole/configuration cross section on site
	Bus line	24 V/2-pole (see wiring diagram)
	Pump control CP	24 V/2-pole (see wiring diagram)
1 cable 10 x 1,5 mm^2	Fault contact CP	230 V/2-pole (see wiring diagram)
	Lock by energy supply company	230 V/2-pole (see wiring diagram)
	Reset	230 V/1-pole (see wiring diagram)
	Heat generator block	230 V/1-pole (see wiring diagram)
	Collective fault	230 V/2-pole (see wiring diagram)
	Electric inset	230 V/1-pole (see wiring diagram)

Options

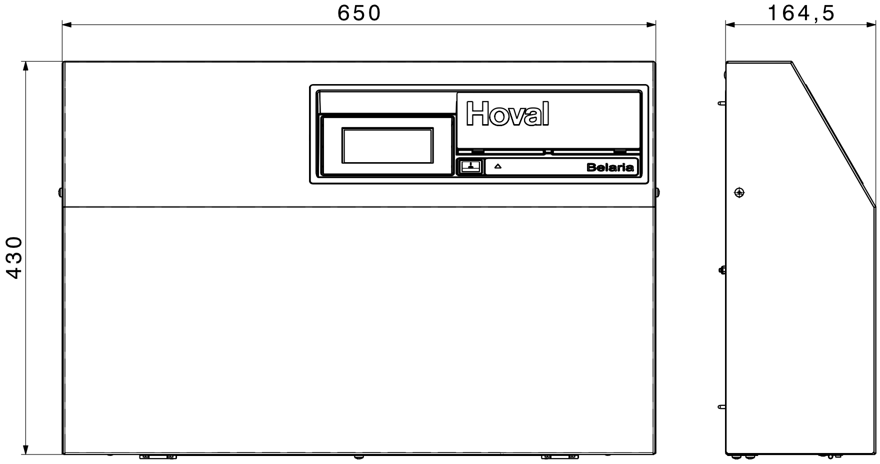
CP pump ON/OFF (does not apply for pump control 0-10 V)	230 V/2-pole (see wiring diagram)
Fault contact for PLC	230 V/2-pole (see wiring diagram)
Flow rate meter	230 V/2-pole (see wiring diagram)
Electricity meter	230 V/2-pole (see wiring diagram)
USB cable for line recorder	
USB 2.0 extension cable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

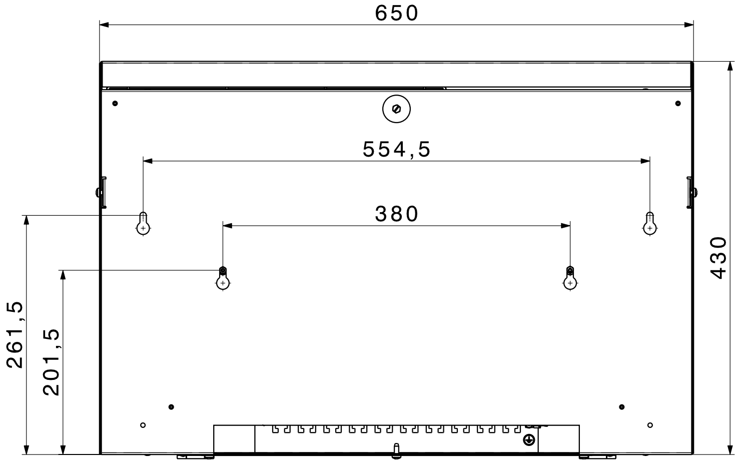
9 Empty tube for hydraulic connections for outdoor unit

Heating flow	R 2″
Heating return	R 2″

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.**

Seal of approval FWS
The UltraSource® T series is certified by the CH certification commission.

The built-in high-efficiency pumps fulfil the Eco-design requirements of 2015 with an EEI of ≤ 0.23.

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+++	1.8-7.8	2.5-9.8
(13)	A+++	A+++	A+++	A+++	2.9-13.3	3.5-13.3
(17)	A+++	A+++	A+++	A+++	4.3-17.6	5.7-21.5

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	1.8-7.8	2.5-9.8
(13/200)	A+++	A+++	A+++	A+++	A	2.9-13.3	3.5-13.3

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

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/CU
- 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 mounted
- Safety set consisting of safety valve, automatic air vent and pressure gauge
- (see accessories)
- Diaphragm pressure expansion tanks see “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/CU
- Integrated calorifier 200 litres
  (can be divided for easier transport into the building; weight 1294 x 770 x 602)
- 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:
  - One speed-regulated high-efficiency pump each on the heating and brine sides
  - Flow sensor/flow meter or heat meter
  - E-heating element 1 to 6 kW
  - Brine side diaphragm pressure expansion tank mounted
- Safety set consisting of safety valve, automatic air vent and pressure gauge (see accessories)
- Diaphragm pressure expansion tanks see “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 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 DHW charging circuit
  - Bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast5 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

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

Part No.

Brine/water heat pump

Energy efficiency class
see “Description”

Modulating brine/water heat pump system for indoor installation with built-in TopTronic® E controller

Integrated control functions for
- 1 heating/cooling circuit with mixer
- 1 heating/cooling circuit without mixer
- 1 DHW charging circuit
- Bivalent and cascade management
- Can be optionally expanded with max. 1 module expansion:
  - 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)

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

Hoval UltraSource® T comfort

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

UltraSource® T comfort Type	Heat output [1) B0W35 kW	Heat output [1) W10W35 kW	Part No.
(8)	1.8-7.8	2.5-9.8	7016 666
(13)	2.9-13.3	3.5-13.3	7016 672
(17)	4.3-17.6	5.7-21.5	7016 678

1) Modulation range

Hose set SH25-25-10-4 — 6046 175
for UltraSource® T comfort (8,13)
Consisting of:
Flexible connection hoses for
heating and brine side insulated 1″
L = 1.0 m, can be shortened on one side

Hose set SH25-32-15-4 — 6046 176
for UltraSource® T comfort (17)
Consisting of:
flexible connection hoses for
heating side insulated 1″
L = 1.0 m, can be shortened on one side
And insulated for brine side 1 1/4″
L = 1.5 m

Hoval UltraSource® T compact

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

UltraSource® T compact Type	Heat output [1] B0W35 kW	W10W35 kW	Part No.
(8/200)	1.8-7.8	2.5-9.8	7016 667
(13/200)	2.9-13.3	3.5-13.3	7016 673

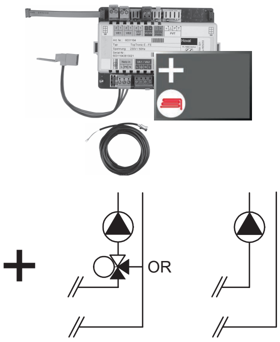
[1] Modulation range

No hose set necessary

Part No.

TopTronic® E module expansions

for TopTronic® E basic module heat generator



TopTronic® E module expansion heating circuit TTE-FE HK

6034 576

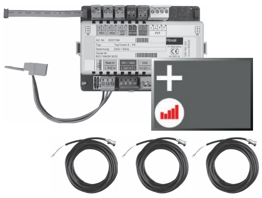
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:

- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

incl. assembly material
1x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

6037 062

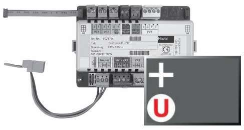
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/hot water module for implementing the following functions:

- 1 heating/cooling circuit without mixer or
- 1 heating/cooling circuit with mixer

each incl. energy balancing

incl. assembly material
3x contact sensor ALF/2P/4/T, L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel



TopTronic® E module expansion universal TTE-FE UNI

6034 575

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

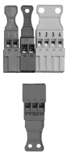
incl. assembly material

Can be installed in:
Boiler control, wall housing, control panel

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

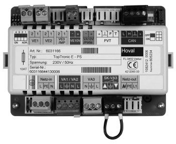
Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

Accessories for TopTronic® E



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 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

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

	Part No.
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

	Part No.
HovalConnect LAN	6049 496
HovalConnect WLAN	6049 498

HovalConnect available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

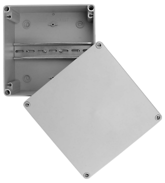
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

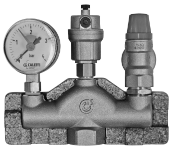
	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

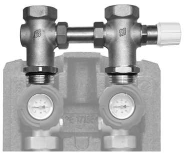
Further information
see “Controls”

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 automatic air vent with cut off valve Connection: 1″ internal thread	641 184
System water protection filter Type: 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 loss. 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 Rp1″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: (∆p<0.1 bar): 5.5 m³/h Weight: 6.8 kg Water temperature: max. 90 °C	2076 374
Strainers see “Various system components”	
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 expansion tank on the side on connection set installation option for an overflow valve incl. non-return valve	6039 793
Bypass valve DN 32 (1¼″) for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m³/h with self-sealing screw connection for mounting between flow and return ball valve	6014 849



Notice:
Fulfills the function of sludge separator and strainer



Part No.

Domestic hot water accessories

Warm water set SW25-25-10-1MD
for UltraSource® B comfort C,
UltraSource® T comfort,
Belaria® comfort ICM (8)
Consisting of:
Motor drive for installed
changeover valve
Includes distance wave and flexible
connection hose insulated 1″
L = 1.0 m

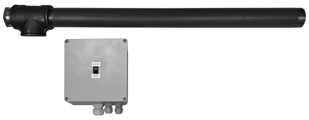
6046 181

Titanium impressed current anode
for UltraSource® B compact C,
UltraSource® T compact
Belaria® pro compact
as cathodic protection for
enamelled calorifier

6046 662

Screw-in electric heating element
for plants with buffer storage tank
as emergency heating.

Type	Heat output [kW]	Install. length [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560



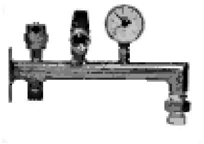
Instantaneous water heater kit DN 50
from ready electrical box
for electrical protection incl.
assembly fittings.
for combination with all screw-in
heating inset EP.
Screw-in heaters must be
ordered separately.

6044 070

Brine accessories

Connection hoses brine already included in hose set for UltraSource® T comfort

	Part No.
Safety group SG15-¾″ Retaining bar incl. safety valve, pressure gauge, air vent and connection fittings for expansion chambers	2015 354



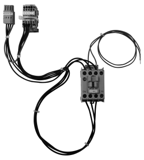
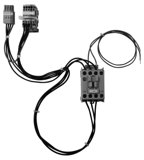
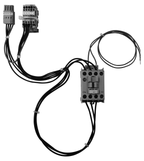
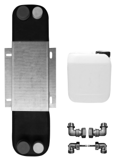
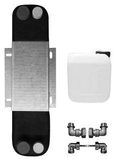
Notice:
Fulfills the function of sludge separator and strainer

	Part No.
System water protection filter Type: 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 loss. 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 Rp2″: Internal thread with integrated shut-off valves and union connection (outlet) Max. flow rate: (∆p<0.1 bar): 7.2 m³/h Weight: 6.9 kg Water temperature: max. 90 °C	2076 375

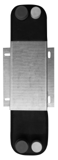
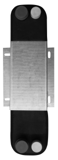
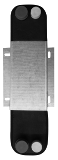
Further strainers
see “Various system components”

	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 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 Max. operating pressure 1.0 MPa (10 bar) Dirt screen integrated	6033 364

Ground water accessories

		Part No.
	**Ground water pump set US T (13)** for UltraSource® T comfort (13) Consisting of: Protection for control of a 3-phase ground water pipe. Ready to connect without thermal surge protect	6046 182
	**Ground water pump set US T (13)** for UltraSource® T compact (13) Consisting of: Protection for control of a 3-phase ground water pump. Ready to connect without thermal overload protection	6046 183
	**Ground water pump set US T (17)** for UltraSource® T comfort (17) Consisting of: Protection for control of a 3-phase ground water pump. Ready to connect without thermal overload protection	6048 004
	Notice: The pump of the UltraSource® T (8) is mono-phase (230 V). Therefore, no ground water kit is required.	
	**Plate heat exchange set** for UltraSource® T comfort, UltraSource® T compact System separation when using the ground water heat source Consisting of: Insulated heat exchanger and bracket for installation, connection bracket and frost protection agent	6046 190
	**Plate heat exchanger set** (stainless steel) for UltraSource® T comfort, UltraSource® T compact System separation when using the ground water heat source Consisting of: Insulated heat exchanger (soldered stainless steel) and bracket for installation, connection bracket and frost protection agent	6046 194
	**Flow monitor set** for UltraSource® T comfort, UltraSource® T compact for installation on ground water side Consisting of: Ground water float ball	6046 186

Passive cooling accessories

		Part No.
	**Passive cooling set US T (8)** for UltraSource® T comfort (8), UltraSource® T compact (8/200) for passive cooling via probe or ground water Consisting of: Insulated heat exchanger and bracket for mounting	6046 177
	**Passive cooling set US T (13)** for UltraSource® T comfort (13), UltraSource® T compact (13/200) for passive cooling via probe or ground water Consisting of: Insulated heat exchanger and bracket for mounting	6046 178
	**Passive cooling set US T (17)** for UltraSource® T comfort (17) for passive cooling via probe or ground water Consisting of: Insulated heat exchanger and bracket for mounting	6046 179

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

Type		**(8)**	**(13)**	**(17)**	**(8/200)**	**(13/200)**
Brine/water application B0W35						
• Energy efficiency class of the compound system with control	35/55°C	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
• Energy efficiency class load profile XL		-	-	-	A	A
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	5.4/4.2	5.5/4.2	5.9 / 4.3	5.4/4.2	5.5/4.2
Water/water application W10W35						
• Energy efficiency class of the compound system with control	35/55°C	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
• Energy efficiency class load profile XL		-	-	-	A	A
• Seasonal coefficient of performance moderate climate 35 °C/55 °C	SCOP	7.9/6.3	8.0/5.6	8.0/5.9	7.9/6.3	8.0/5.6
Max./min. performance data heating in acc. with EN 14511						
• Max. heat output B0W35	kW	7.9	13.3	17.6	7.9	13.3
• Min. heat output B0W35	kW	1.8	2.9	4.3	1.8	2.9
• Max. heat output W10W35	kW	10.0	13.2	21.9	10.0	13.2
• Min. heat output W10W35	kW	2.6	3.7	6.0	2.6	3.7
Nominal performance data heating in acc. with EN 14511						
• Nominal heat output B0W35	kW	4.1	6.6	11.4	4.1	6.6
• Power consumption B0W35	kW	0.9	1.3	2.3	0.9	1.3
• Coefficient of performance B0W35	COP	4.7	5.0	5.1	4.7	5.0
• Nominal heat output W10W35	kW	5.6	8.7	15.2	5.6	8.7
• Power consumption W10W35	kW	0.9	1.3	2.4	0.9	1.3
• Coefficient of performance W10W35	COP	6.5	6.8	6.5	6.5	6.8
Sound data in acc. with EN 12102						
• Sound power level (nominal)	dB(A)	45	41	44	45	41
• Sound power level (maximum)	dB(A)	51	47	55	51	47
Hydraulic data						
• Max. flow temperature (without/with screw-in electrical heating inset)	°C	62	63	62	62/65	63/65
• Max. operating pressure source side	bar	3	3	3	3	3
• Max. operating pressure on the heating side	bar	3	3	3	3	3
• Heating flow and return connection	R	1″	1″	1″	1″	1″
• Connections source side	R	1″	1″	5/4″	1″	1″
Nominal flow rate and pressure drop brine/water						
• Heating (dT = 5K)						
- Max. flow rate B0/W35	m^3/h	1.4	2.3	3.0	1.4	2.3
- Nominal flow rate	m^3/h	0.7	1.1	2	0.7	1.1
- Pressure drop	kPa	7	9	35	7	9
- Residual overpressure (max. pump speed)	kPa	69	76	47	69	76
• Heat source (dT = 3K)						
- Max. flow rate B0/W35	m^3/h	1.8	3.0	4.1	1.8	3.0
- Nominal flow rate	m^3/h m^3/h	0.98	1.6	2.8	0.98	1.6
- Pressure drop	kPa	9	9	22	9	9
- Residual overpressure	kPa	72	76	49	72	76
Nominal flow rate and pressure drop water/water						
• Heating (dT = 5K)						
- Max. flow rate W10/W35	m^3/h	1.7	2.3	3.8	1.7	2.3
- Nominal flow rate	m^3/h	0.95	1.5	2.62	0.95	1.5
- Pressure drop	kPa	12	14	61	12	14
- Residual overpressure (max. pump speed)	kPa	62	78	13	62	78
• Heat source (dT = 3K)						
- Max. flow rate W10/W35	m^3/h	2.4	3.2	5.2	2.4	3.2
- Nominal flow rate	m^3/h	1.4	2.1	3.7	1.4	2.1
- Pressure drop	kPa	5	13	44	13	44
- Residual overpressure max. pump speed	kPa	69	64	18	69	64
Cooling technical data						
• Refrigerant		R410A	R410A	R410A	R410A	R410A
• Compressor/stages		1-modulating	1-modulating	1-modulating	1-modulating	1-modulating
• Refrigerant filling quantity	kg	2.3	3	3.8	2.3	3
• Compressor oil filling quantity	l	0.35	0.74	1	0.35	0.74
• Type of compressor oil		DAPHNE HERMETIC OIL FV50S	Emkarate RL32 - 3MAF	DAPHNE HERMETIC OIL FVC68D	DAPHNE HERMETIC OIL FV50S	Emkarate RL32 - 3MAF

Type		**(8)**	**(13)**	**(17)**	**(8/200)**	**(13/200)**
Electrical data						
• Electrical connection compressor	V/Hz	1~230/50	3x 400 / 50	3x 400 / 50	1~230/50	3~400/50
• Electrical connection electric heating element	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	1~230/50	1~230/50
• Compressor operating current max.	A	15.8	9	14.79	15.8	9
• Electric heating element operating current max.	A	-	-	-	13	13
• Starting current	A	<15.8	<9	<14.79	<15.8	<9
• Output factor	-	0.99	0.97	0.95	0.99	0.97
• Main current fuse	A	16	13	16	16	13
- Type		C,K	C,K	C,K	C,K	C,K
• Control current fuse	A	13	13	13	13	13
- Type		B.Z	B.Z	B.Z	B.Z	B.Z
• Fuse electric heating element	A	13	13	-	13	13
- Type		B.Z	B.Z	-	B.Z	B.Z
Dimensions/weight						
• Dimensions (H x W x D)	mm	see Dimensions				
• Tilting dimension	mm	-	-	-	2150	2150
• Weight	kg	165	170	196	265	270
• Minimum sizes of installation room 1)	m3	5.2	6.8	8.6	5.2	6.8
Hot water storage tank						
• 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°) 2)	l	-	-	-	260	260
• Output capacity at 40 °C draw-off temperature - heat pump (= Tsp = 58°) 2)	l	-	-	-	315	315

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

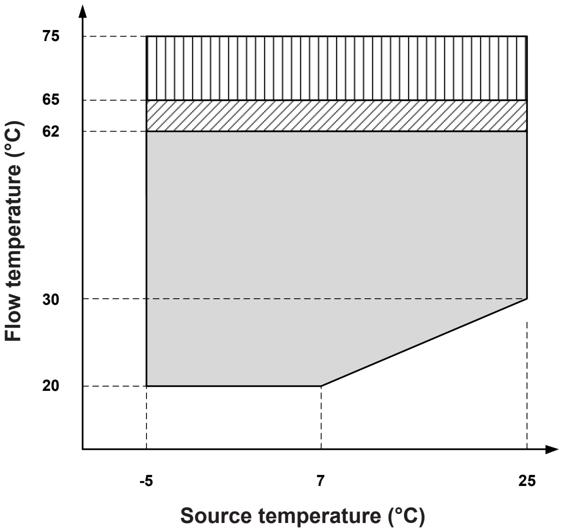
1) If the installation room is smaller than the required minimum size. it must be designed as a machine room in accordance with EN 378.

2) 12 °C cold water temperature/58 °C storage tank temperature

Diagram of area of application

Heading and hot water

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

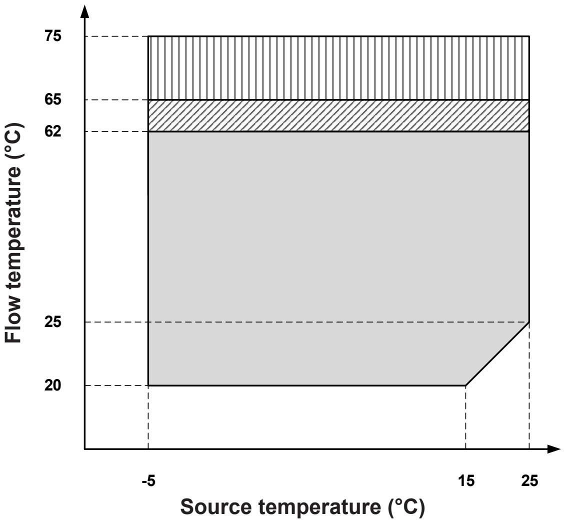


□ Area of application heating heat pump (UltraSource® T comfort C and compact C)

▨ Extended area of application heating heat pump including electric heating element (only UltraSource® T compact)

▥ Extended area of application domestic hot water heat pump including electric heating element (only UltraSource® T compact)

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

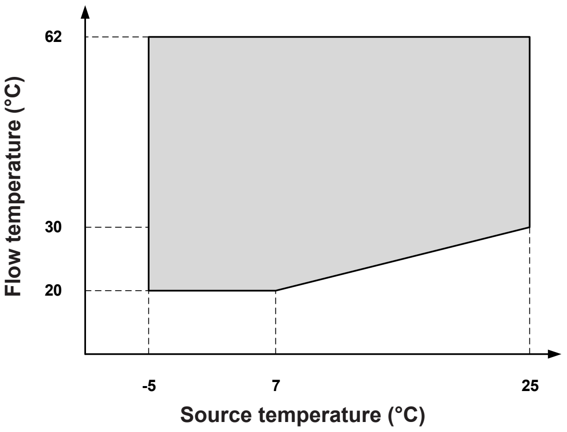


□ Area of application heating heat pump (UltraSource® T comfort C and compact C)

▨ Extended area of application heating heat pump including electric heating element (only UltraSource® T compact)

▥ Extended area of application domestic hot water heat pump including electric heating element (only UltraSource® T compact)

UltraSource® T comfort (17)



□ Area of application heating heat pump (UltraSource® T comfort C and compact C)

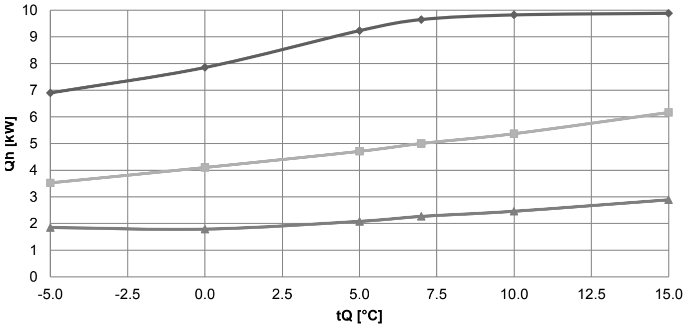
Performance data – heating

Maximum heat output

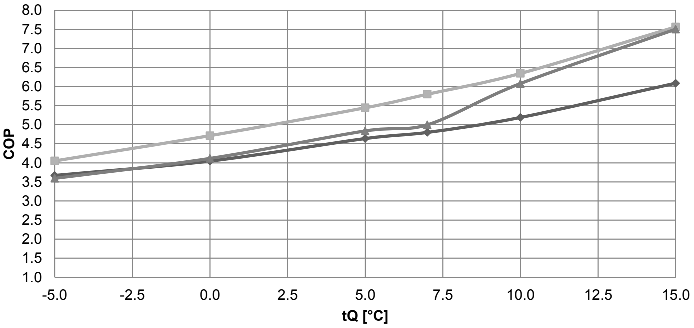
UltraSource® T comfort (8), compact (8/200) with R410A

Data according to EN 14511

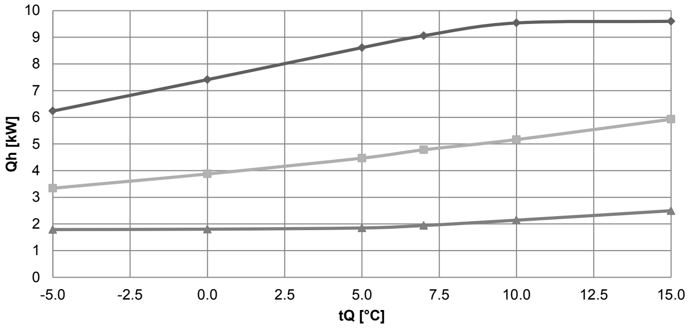
Heat output - t_{FL} 35 °C



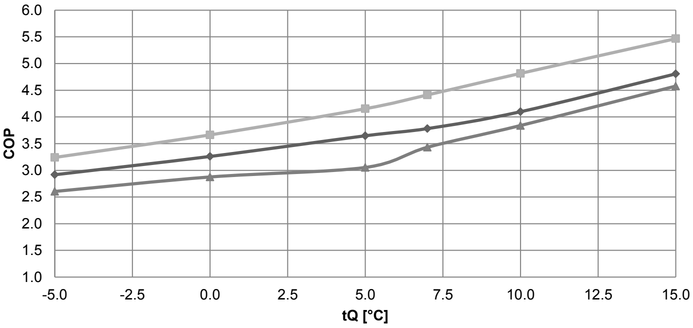
Coefficient of performance - t_{FL} 35 °C



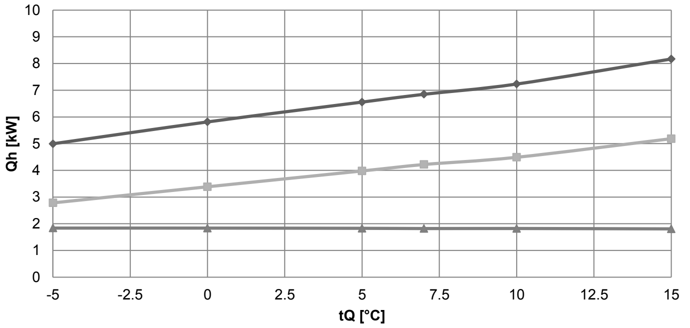
Heat output - t_{FL} 45 °C



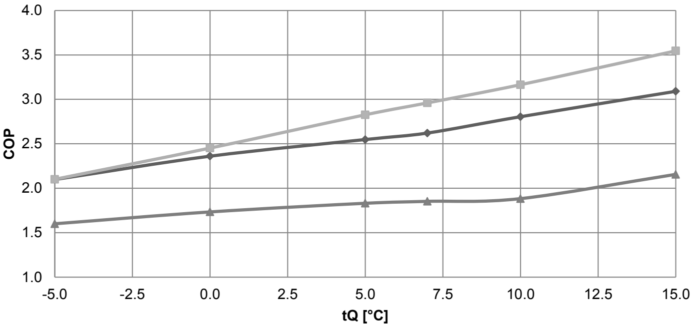
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 62 °C



Coefficient of performance - t_{FL} 62 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

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

Data according to EN 14511

Type flow tFL (°C)	Heat source Medium t1	tQ °C	Maximum output Qh kW	Maximum output P kW	Maximum output COP	Nominal output Qh kW	Nominal output P kW	Nominal output COP	Minimum output Qh kW	Minimum output P kW	Minimum output COP
35	Brine	-5	6.9	1.9	3.7	3.5	0.9	4.1	1.9	0.5	3.6
		0	7.9	1.9	4.0	4.1	0.9	4.7	1.8	0.4	4.1
		5	9.2	2.0	4.6	4.7	0.9	5.4	2.1	0.4	4.8
		7	9.6	2.0	4.8	5.0	0.9	5.8	2.3	0.5	5.0
		10	9.8	1.9	5.2	5.4	0.8	6.3	2.5	0.4	6.1
		15	9.9	1.6	6.1	6.2	0.8	7.6	2.9	0.4	7.5
	Water	7	9.8	1.9	5.2	5.1	0.9	5.9	2.4	0.4	5.5
		10	10.0	1.8	5.5	5.6	0.9	6.5	2.6	0.4	6.7
		15	10.1	1.6	6.4	6.4	0.8	7.8	3.0	0.4	8.3
45	Brine	-5	6.2	2.1	2.9	3.3	1.0	3.2	1.8	0.7	2.6
		0	7.4	2.3	3.3	3.9	1.1	3.7	1.8	0.6	2.9
		5	8.6	2.4	3.6	4.5	1.1	4.2	1.9	0.6	3.1
		7	9.1	2.4	3.8	4.8	1.1	4.4	1.9	0.6	3.4
		10	9.5	2.3	4.1	5.2	1.1	4.8	2.1	0.6	3.8
		15	9.6	2.0	4.8	5.9	1.1	5.5	2.5	0.5	4.6
	Water	7	9.2	2.3	3.9	4.7	1.1	4.4	2.0	0.5	3.8
		10	9.8	2.3	4.3	5.2	1.1	4.8	2.3	0.5	4.2
		15	9.9	2.0	5.1	6.0	1.1	5.5	2.6	0.5	5.1
50	Brine	-5	5.9	2.3	2.6	3.2	1.1	2.8	1.8	0.8	2.3
		0	7.0	2.5	2.9	3.8	1.2	3.2	1.8	0.7	2.5
		5	8.2	2.6	3.2	4.3	1.2	3.7	1.8	0.7	2.6
		7	8.6	2.6	3.3	4.6	1.2	3.9	1.8	0.6	2.9
		10	9.2	2.6	3.5	5.0	1.2	4.2	2.0	0.6	3.3
		15	9.4	2.2	4.2	5.7	1.2	4.7	2.4	0.6	4.0
	Water	7	8.9	2.6	3.4	4.5	1.2	3.8	1.9	0.6	3.1
		10	9.6	2.5	3.8	5.0	1.2	4.1	2.1	0.6	3.4
		15	9.7	2.2	4.4	5.7	1.2	4.7	2.4	0.6	4.1
55	Brine	-5	5.4	2.2	2.5	3.1	1.2	2.6	1.8	0.9	2.0
		0	6.3	2.3	2.8	3.6	1.3	2.9	1.8	0.9	2.1
		5	7.2	2.4	3.0	4.2	1.3	3.3	1.8	0.8	2.3
		7	7.5	2.4	3.1	4.5	1.3	3.5	1.9	0.8	2.4
		10	8.0	2.4	3.3	4.8	1.3	3.8	1.8	0.7	2.5
		15	9.1	2.5	3.7	5.6	1.3	4.2	2.2	0.7	3.1
	Water	7	8.0	2.4	3.3	4.3	1.3	3.3	2.0	0.7	2.6
		10	8.6	2.5	3.4	4.7	1.3	3.6	1.9	0.7	2.8
		15	9.5	2.6	3.7	5.5	1.3	4.1	2.3	0.7	3.4
62	Brine	-5	5.0	2.4	2.1	2.8	1.3	2.1	1.8	1.1	1.6
		0	5.8	2.5	2.4	3.4	1.4	2.5	1.8	1.1	1.7
		5	6.6	2.6	2.5	4.0	1.4	2.8	1.8	1.0	1.8
		7	6.8	2.6	2.6	4.2	1.4	3.0	1.8	1.0	1.9
		10	7.2	2.6	2.8	4.5	1.4	3.2	1.8	1.0	1.9
		15	8.2	2.6	3.1	5.2	1.5	3.5	1.8	0.8	2.2
	Water	7	7.4	2.7	2.7	4.0	1.4	2.8	1.9	1.0	1.9
		10	8.0	2.8	2.9	4.3	1.5	3.0	1.9	0.9	2.1
		15	9.0	2.8	3.2	5.0	1.5	3.4	1.9	0.8	2.4

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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”

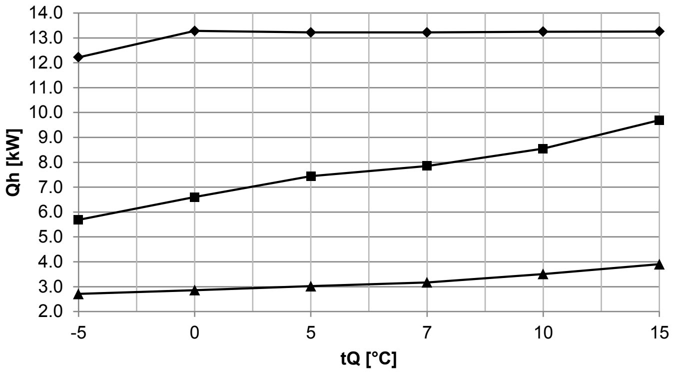
Performance data – heating

Maximum heat output

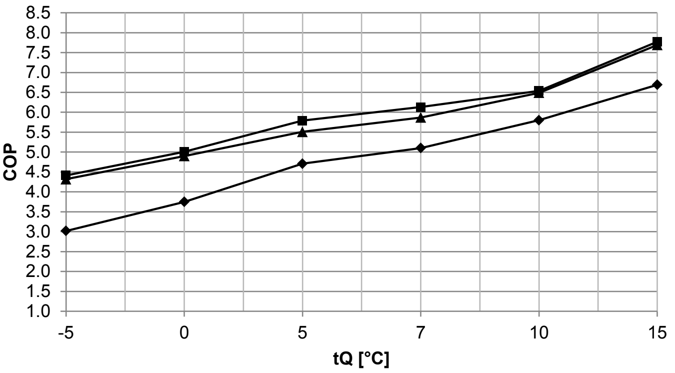
UltraSource® T comfort (13), compact (13/200) with R410A

Data according to EN 14511

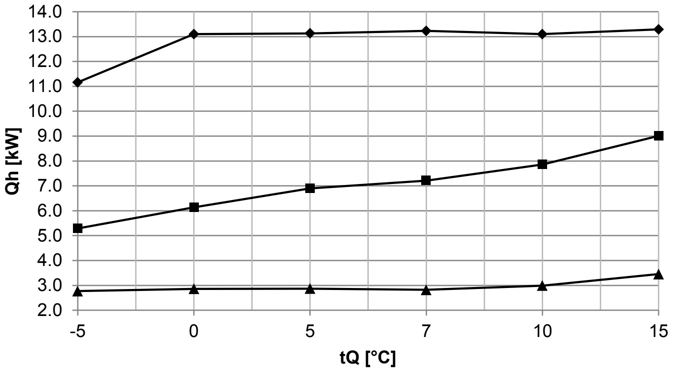
Heat output - t_{FL} 35 °C



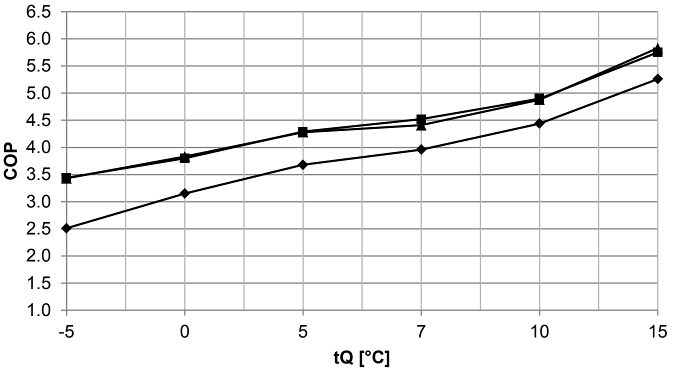
Coefficient of performance - t_{FL} 35 °C



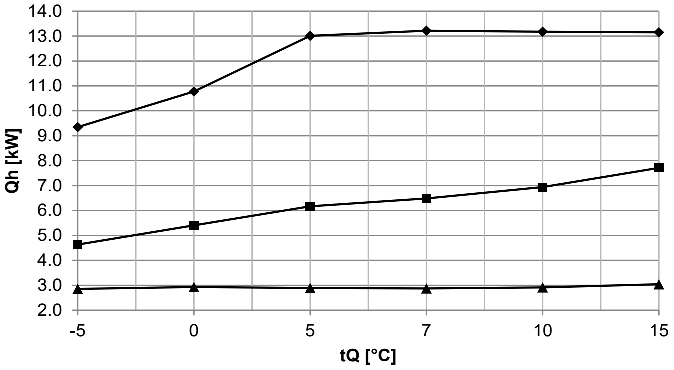
Heat output - t_{FL} 45 °C



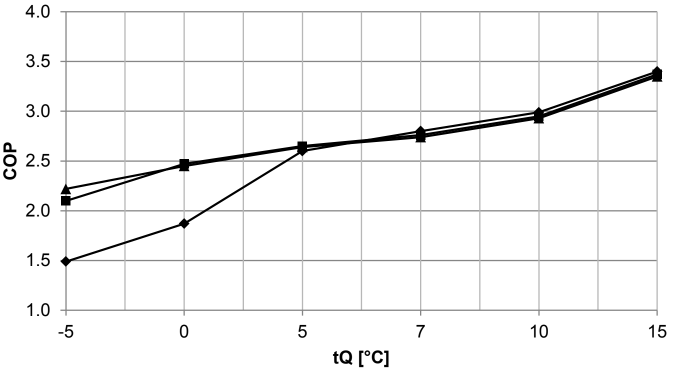
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 62 °C



Coefficient of performance - t_{FL} 62 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

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

Data according to EN 14511

Type flow tFL (°C)	Heat source Medium t1	tQ °C	Maximum output			Nominal output			Minimum output		
			Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	Brine	-5	12.2	4.0	3.0	5.7	1.3	4.4	2.7	0.6	4.3
		0	13.3	3.5	3.8	6.6	1.3	5.0	2.9	0.6	4.9
		5	13.2	2.8	4.7	7.4	1.3	5.8	3.0	0.5	5.5
		7	13.2	2.6	5.1	7.8	1.3	6.1	3.2	0.5	5.9
		10	13.2	2.3	5.8	8.6	1.3	6.5	3.5	0.5	6.5
		15	13.3	2.0	6.7	9.7	1.2	7.8	3.9	0.5	7.7
	Water	7	13.2	2.5	5.3	8.0	1.3	6.3	3.4	0.6	6.1
		10	13.2	2.2	6.0	8.7	1.3	6.8	3.7	0.6	6.7
		15	13.3	1.9	6.9	9.8	1.2	8.0	4.1	0.5	7.9
45	Brine	-5	11.2	4.4	2.5	5.3	1.5	3.4	2.8	0.8	3.4
		0	13.1	4.2	3.2	6.1	1.6	3.8	2.9	0.7	3.8
		5	13.1	3.6	3.7	6.9	1.6	4.3	2.9	0.7	4.3
		7	13.2	3.3	4.0	7.2	1.6	4.5	2.8	0.6	4.4
		10	13.1	3.0	4.4	7.9	1.6	4.9	3.0	0.6	4.9
		15	13.3	2.5	5.3	9.0	1.6	5.8	3.5	0.6	5.8
	Water	7	13.2	3.2	4.2	7.4	1.6	4.7	3.0	0.6	4.7
		10	13.1	2.8	4.6	8.1	1.6	5.1	3.2	0.6	5.1
		15	13.3	2.4	5.5	9.2	1.5	6.0	3.6	0.6	5.9
50	Brine	-5	10.6	4.8	2.2	5.1	1.7	3.0	2.9	0.9	3.2
		0	12.4	4.6	2.7	5.9	1.7	3.4	2.9	0.8	3.5
		5	13.3	4.1	3.3	6.6	1.7	3.8	3.0	0.7	4.0
		7	13.2	3.7	3.5	6.9	1.7	4.0	2.9	0.7	4.1
		10	13.1	3.4	3.9	7.6	1.8	4.3	2.9	0.7	4.5
		15	13.3	2.9	4.6	8.7	1.8	4.9	3.2	0.6	5.0
	Water	7	13.2	3.5	3.8	7.1	1.7	4.2	3.0	0.7	4.4
		10	13.1	3.2	4.1	7.7	1.7	4.5	3.1	0.7	4.7
		15	13.3	2.7	4.8	8.8	1.7	5.1	3.4	0.6	5.3
55	Brine	-5	10.1	5.7	1.8	4.9	1.9	2.6	2.9	1.0	2.8
		0	11.9	5.2	2.3	5.8	1.9	3.0	2.9	1.0	3.0
		5	13.2	4.5	3.0	6.4	1.9	3.3	2.9	0.8	3.4
		7	13.2	4.2	3.2	6.7	2.0	3.4	2.8	0.8	3.5
		10	13.1	3.8	3.5	7.2	2.0	3.7	2.8	0.7	3.8
		15	13.2	3.3	4.1	8.2	2.0	4.2	3.1	0.7	4.4
	Water	7	13.2	3.9	3.4	6.9	1.9	3.5	3.0	0.8	3.7
		10	13.1	3.6	3.7	7.4	1.9	3.9	3.0	0.8	4.0
		15	13.2	3.1	4.3	8.4	1.9	4.3	3.3	0.7	4.5
62	Brine	-5	9.3	6.3	1.5	4.6	2.2	2.1	2.9	1.3	2.2
		0	10.8	5.8	1.9	5.4	2.2	2.5	2.9	1.2	2.5
		5	13.0	5.0	2.6	6.2	2.3	2.7	2.9	1.1	2.6
		7	13.2	4.7	2.8	6.5	2.3	2.8	2.9	1.0	2.7
		10	13.2	4.4	3.0	6.9	2.4	3.0	2.9	1.0	2.9
		15	13.2	3.9	3.4	7.7	2.3	3.4	3.0	0.9	3.4
	Water	7	13.2	4.4	3.0	6.7	2.3	2.9	2.9	1.0	3.0
		10	13.2	4.2	3.2	7.1	2.3	3.1	3.0	1.0	3.1
		15	13.2	3.7	3.6	7.9	2.2	3.6	3.2	0.9	3.5

tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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”

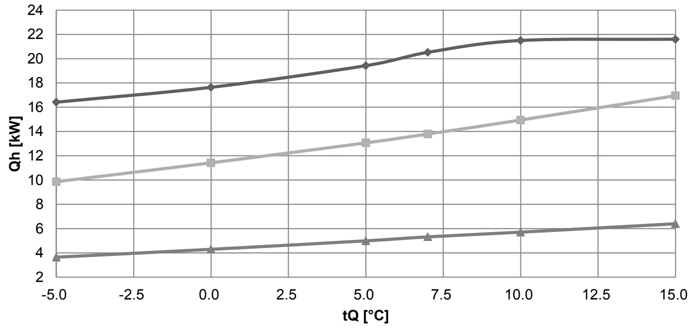
Performance data – heating

Maximum heat output

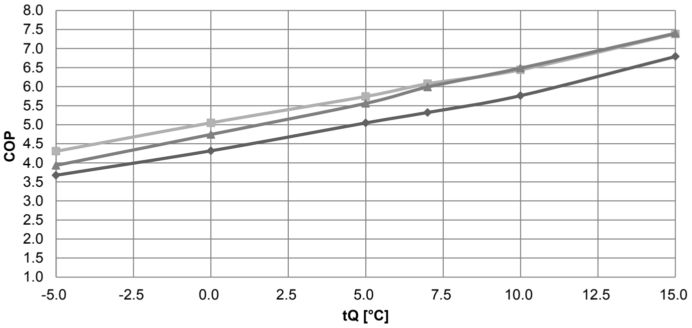
UltraSource® T comfort (17) with R410A

Data according to EN 14511

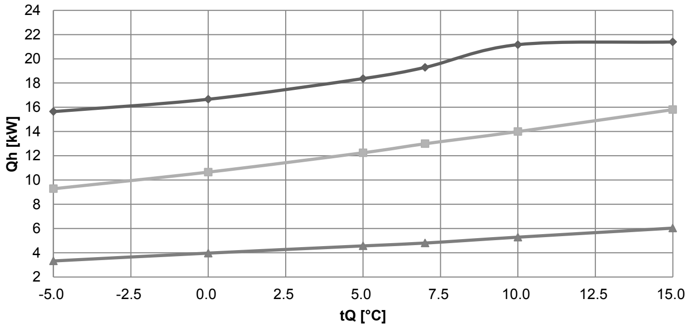
Heat output - t_{FL} 35 °C



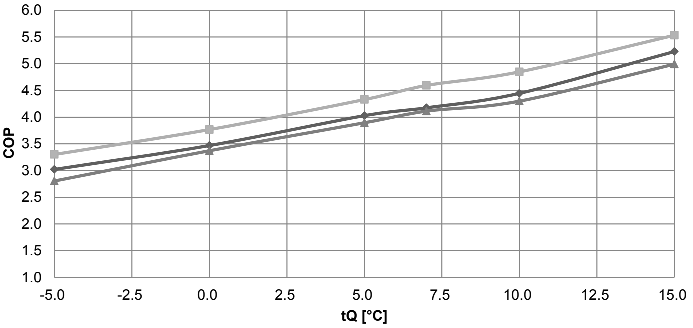
Coefficient of performance - t_{FL} 35 °C



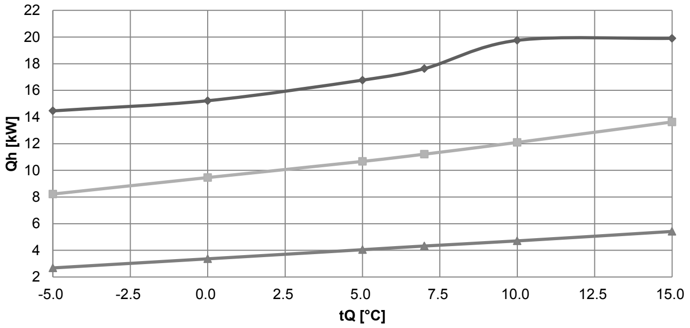
Heat output - t_{FL} 45 °C



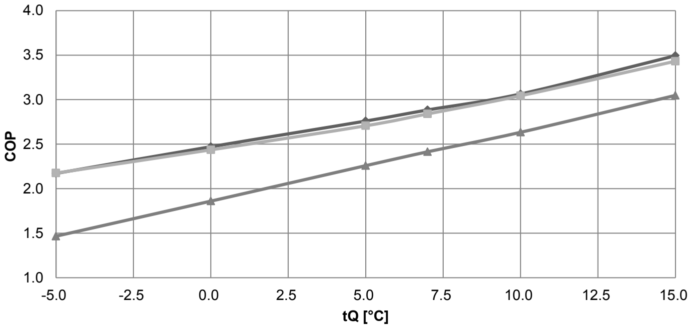
Coefficient of performance - t_{FL} 45 °C



Heat output - t_{FL} 62 °C



Coefficient of performance - t_{FL} 62 °C



tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = 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
■ Nominal output
▲ Minimum output

Performance data – heating

UltraSource® T comfort (17) with R410A

Data according to EN 14511

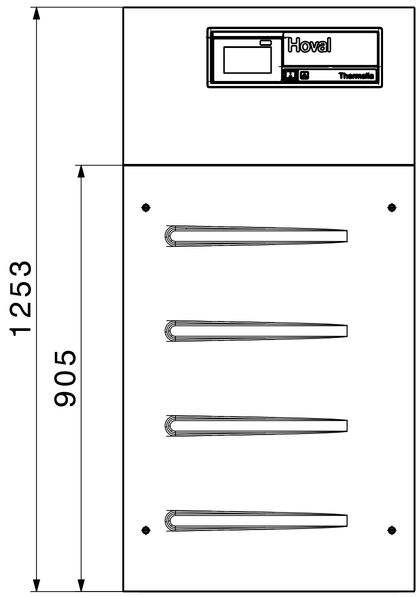
Type flow tFL (°C)	Heat source Medium t1	tQ °C	Maximum output Qh kW	Maximum output P kW	Maximum output COP	Nominal output Qh kW	Nominal output P kW	Nominal output COP	Minimum output Qh kW	Minimum output P kW	Minimum output COP
35	Brine	-5	16.4	4.5	3.7	9.9	2.3	4.3	3.6	0.9	3.9
		0	17.6	4.1	4.3	11.4	2.3	5.1	4.3	0.9	4.7
		5	19.4	3.8	5.0	13.1	2.3	5.7	5.0	0.9	5.6
		7	20.5	3.9	5.3	13.8	2.3	6.1	5.3	0.9	6.0
		10	21.5	3.7	5.8	14.9	2.3	6.4	5.7	0.9	6.5
		15	21.6	3.2	6.8	17.0	2.3	7.4	6.4	0.9	7.4
	Water	7	20.5	3.7	5.6	14.1	2.4	5.9	5.4	0.9	6.4
		10	21.9	3.9	5.7	15.2	2.4	6.5	6.0	0.8	7.1
		15	22.5	3.4	6.6	17.4	2.4	7.4	6.9	0.8	8.7
45	Brine	-5	15.6	5.2	3.0	9.3	2.8	3.3	3.3	1.2	2.8
		0	16.7	4.8	3.5	10.7	2.8	3.8	4.0	1.2	3.4
		5	18.4	4.6	4.0	12.2	2.8	4.3	4.6	1.2	3.9
		7	19.3	4.6	4.2	13.0	2.8	4.6	4.8	1.2	4.1
		10	21.2	4.8	4.4	14.0	2.9	4.8	5.3	1.2	4.3
		15	21.4	4.1	5.2	15.8	2.9	5.5	6.0	1.2	5.0
	Water	7	19.6	4.8	4.1	13.1	3.0	4.4	5.0	1.1	4.4
		10	21.6	5.0	4.3	14.2	2.9	4.9	5.4	1.1	4.7
		15	21.8	4.2	5.1	16.2	2.9	5.6	6.3	1.1	5.6
50	Brine	-5	15.2	5.6	2.7	8.8	3.1	2.9	3.1	1.3	2.4
		0	16.2	5.2	3.1	10.2	3.1	3.3	3.8	1.3	2.9
		5	17.7	5.0	3.5	11.8	3.1	3.8	4.4	1.3	3.4
		7	18.7	5.0	3.7	12.5	3.1	4.0	4.7	1.3	3.6
		10	20.7	5.3	3.9	13.5	3.2	4.2	5.1	1.4	3.7
		15	21.0	4.6	4.6	15.3	3.2	4.8	5.8	1.4	4.2
	Water	7	-	-	-	12.6	3.2	3.9	-	-	-
		10	-	-	-	13.7	3.2	4.2	-	-	-
		15	-	-	-	15.6	3.2	4.9	-	-	-
55	Brine	-5	15.0	5.9	2.6	8.7	3.3	2.6	2.9	1.5	1.9
		0	15.8	5.5	2.9	10.2	3.4	3.0	3.5	1.5	2.3
		5	17.3	5.3	3.2	11.5	3.4	3.4	4.2	1.5	2.9
		7	18.1	5.4	3.4	12.1	3.4	3.6	4.5	1.5	3.0
		10	20.2	5.6	3.6	13.0	3.5	3.7	4.9	1.5	3.2
		15	20.3	4.8	4.2	14.7	3.5	4.2	5.6	1.5	3.7
	Water	7	18.9	5.3	3.6	12.4	3.4	3.6	4.6	1.5	3.2
		10	20.6	5.7	3.6	13.6	3.5	3.9	5.2	1.5	3.5
		15	20.7	5.2	4.0	15.2	3.4	4.4	6.0	1.4	4.2
62	Brine	-5	14.5	6.7	2.2	8.2	3.8	2.2	2.7	1.8	1.5
		0	15.2	6.2	2.5	9.5	3.9	2.4	3.4	1.8	1.9
		5	16.8	6.1	2.8	10.7	3.9	2.7	4.0	1.8	2.3
		7	17.6	6.1	2.9	11.2	3.9	2.8	4.3	1.8	2.4
		10	19.8	6.4	3.1	12.1	4.0	3.0	4.7	1.8	2.6
		15	19.9	5.7	3.5	13.6	4.0	3.4	5.4	1.8	3.0
	Water	7	17.4	6.1	2.9	11.3	4.0	2.8	4.0	1.8	2.2
		10	20.1	6.7	3.0	12.3	4.0	3.1	4.5	1.8	2.5
		15	20.3	5.9	3.4	13.9	4.0	3.5	5.4	1.8	3.0

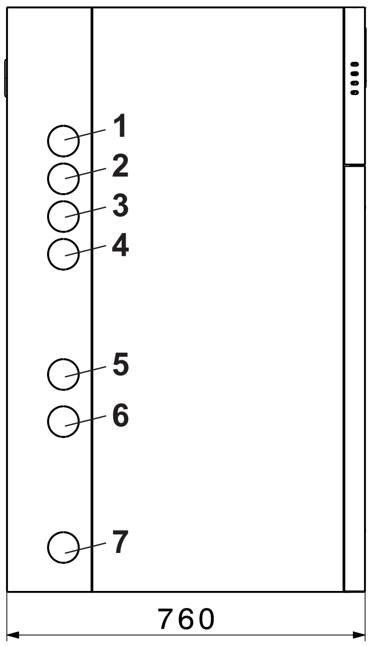
tFL = Heating flow temperature (°C)
tQ = Source temperature (°C)
Qh = Heat output (kW), measured in accordance with standard EN 14511 with 25 % ethylene glycol (Antifrogen N)
P = Power consumption, overall unit (kW)
COP = Coefficient of performance for the overall unit in accordance with standard EN 14511

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

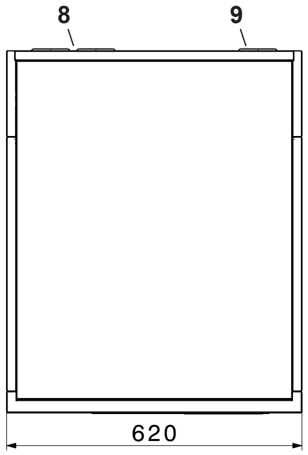
UltraSource® T comfort (8-17)
Indoor unit

(Dimensions in mm)





View from above



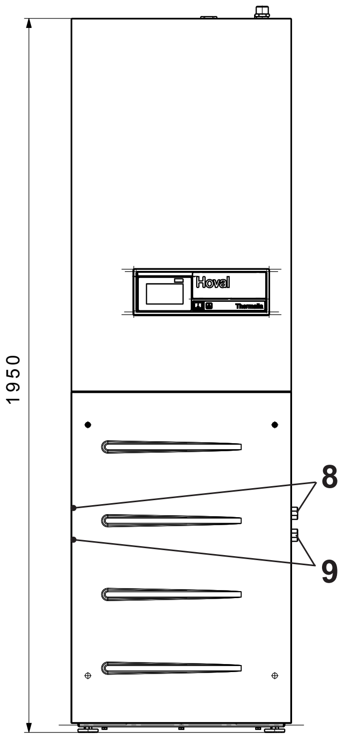
Connections (1-7) on either the left or right side

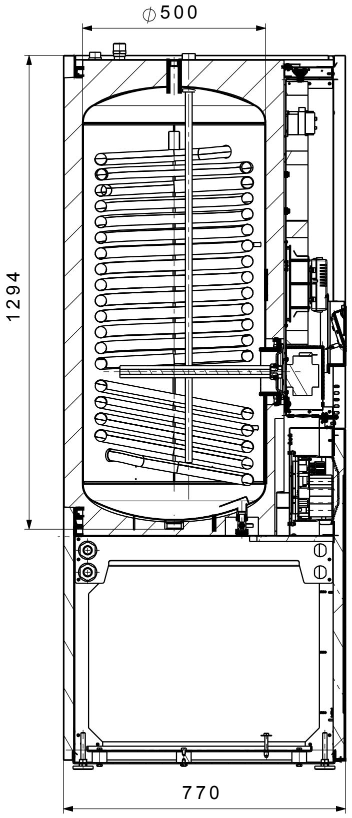
1 Free
2 Brine outlet 1″
3 Flow heating 1″
4 Flow hot water charging 1″
5 Brine inlet 1″
6 Free
7 Return heating 1″
8 Cable feed-in main current
9 Cable feed-in sensors

The indoor unit must be accessible from above.

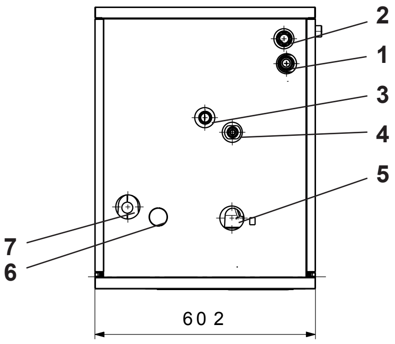
UltraSource® T compact (8,13/200)
Indoor unit with calorifier

(Dimensions in mm)





View from above

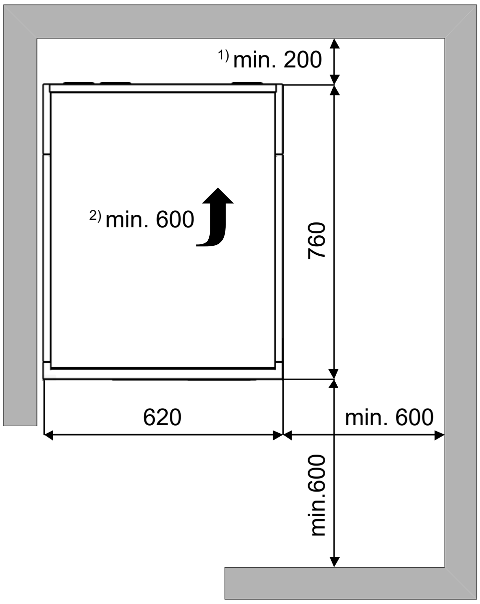


1 Flow heating 1″
2 Return heating 1″
3 Hot water connection ¾″
4 Cold water connection ¾″
5 Cable feed-in sensors
6 Circulation connection ¾″
7 Cable feed-in main current
8 Brine entry (connection right or left) 1″
9 Brine exit (connection right or left) 1″

Space requirement

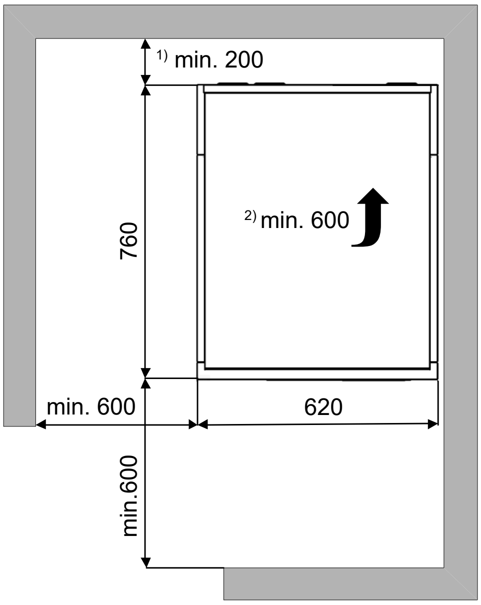
(Dimensions in mm)

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



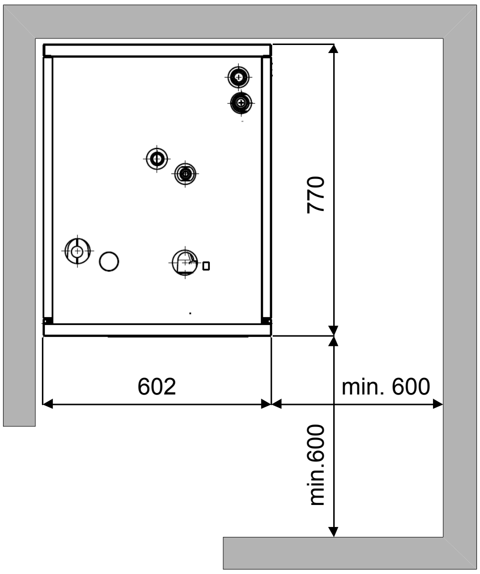
[1] A gap of at least 200 mm must be guaranteed at the rear for the electrical connection.

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.
- 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 pipe 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 pipe 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 pipe are changed over on site. If the brine pipe 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

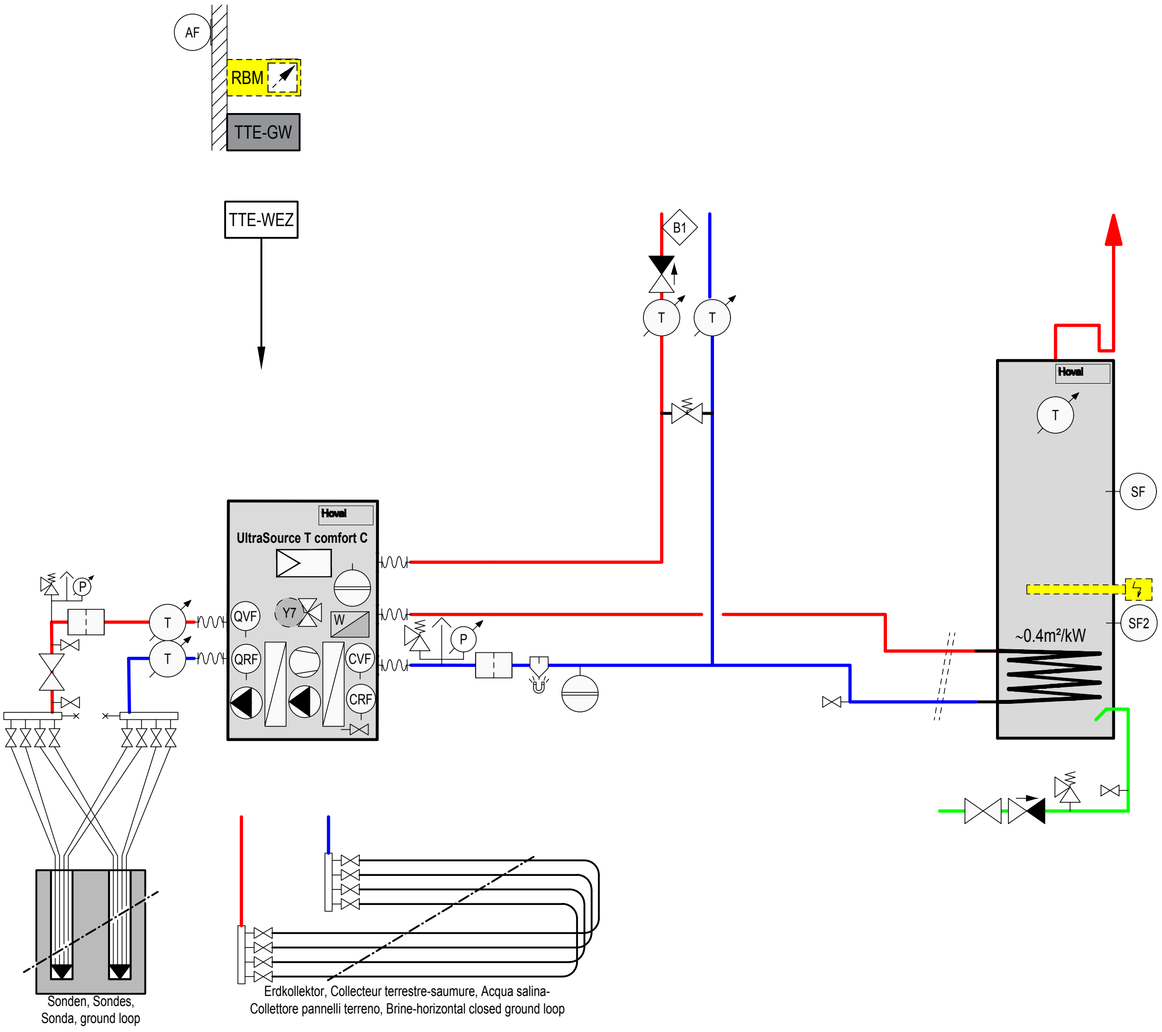
- The electrical connection must be carried out by a qualified technician and registered with the responsible energy supply company. The relevant electrical installation company is responsible for ensuring that electrical connection is carried out in accordance with standards and that safeguard measures 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. A “zeroing TN-S” can be used instead of the RCCB type B. Country-specific requirements must be complied with. If the “fault-current circuit breaker” safeguard measure is implemented nevertheless by the electrical company, a separate fault-current circuit breaker is recommended for the heat pumps.
- This residual-current circuit breaker must be of the all-current-sensitive type B ($I\Delta N \geq$ 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”

UltraSource® T comfort

Brine/water and water/water heat pump with
- Earth probes
- 1 direct circuit

Hydraulic schematic BBBFE010



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
B1	Flow temperature monitor (if required)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
W	Flow sensor (FVT)

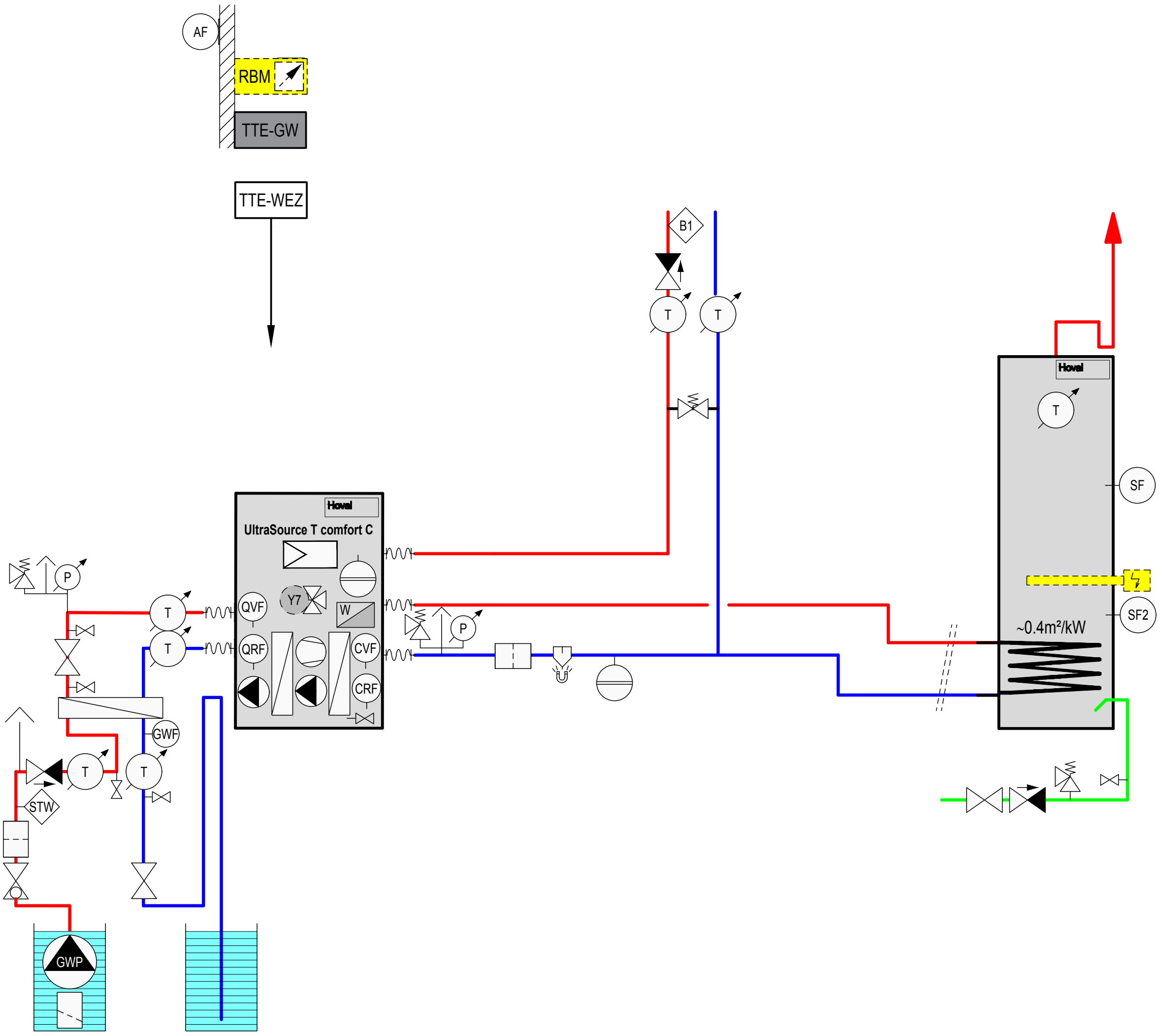
Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
Y7	Switching valve

UltraSource® T comfort

Brine/water and water/water heat pump with
- Water/water - indirect use
- 1 direct circuit

Hydraulic schematic BBBFE030



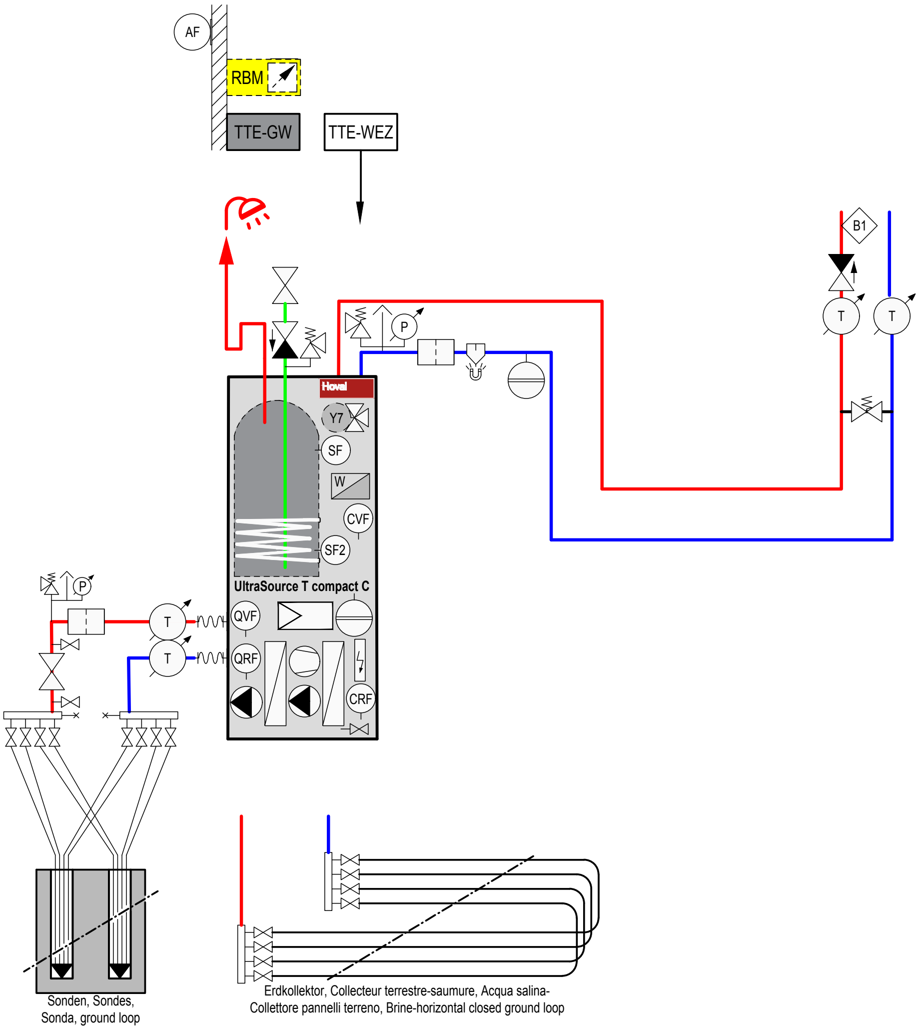
Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
B1	Flow temperature monitor (if required)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
W	Flow sensor (FVT)
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
Y7	Switching valve

UltraSource® T compact

Brine/water and water/water heat pump with
- Integrated calorifier
- Earth probes
- 1 direct circuit

Hydraulic schematic BBBEE010



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on site, dimensioning and local regulations.
- With underfloor heating, a flow temperature monitor must be installed.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install pockets to prevent single-pipe gravity circulation!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
B1	Flow temperature monitor (if required)
CRF	Condenser return sensor
CVF	Condenser flow sensor
QVF	Heat source flow sensor
QRF	Heat source return sensor
Y7	Actuator for hot water production
T	Differential control sensor
W	Flow sensor (FVT)
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

Hoval Thermalia® comfort

Brine/water-water/water heat pump

- Brine/water-water/water heat pump in compact design with high energy efficiency for indoor installation. 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)
- Safety valve incl. hose installed at the side of the heating
- Comprising a spiral (Scroll) compressor
- Electronic expansion valve
- Plate heat exchanger system of stainless steel
- Electronic starting current limiter with rotary field/phase monitoring.
- Speed-controlled, highly efficient heating and brine pump
- 3-way switch ball valve for heating and hot water
- Integrated brine pressure monitoring
- Brine pressure gauge and pressure valve incl. hose
- Brine expansion vessel 18 litres
  Hydraulic connections with flexible hoses, removable to the left, right or top:
  comfort (6-13): 1″ 2x 1 m top,
  1″ 2x 1.5 m bottom
  comfort (17): 1 ¼″ 2x 1.52 m top,
  2x 1 m bottom
  comfort H (7,10): 1″ 1x 1 m resp. 1x 0.85 m top,
  2x 1.75 m bottom
- Sound-insulating floor mat
- Refrigerant
  Thermalia® comfort (6-17) with R410A
  Thermalia® comfort H (7,10) with R134a
- Heat pump wired ready
- Temperatures and pressures of brine and refrigeration circuit available
- TopTronic® E controller installed

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)

Seal of approval FWS
The Thermalia® comfort (6-17), comfort H (7,10) series are certified by the seal of approval of the authorisation commission of Switzerland.

The built-in high-efficiency pumps fulfil the Ecodesign requirements of 2015 with an EEI of ≤ 0.23.

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
(6)	A+++	A+++	A++	A+	R410A	62	5.8	7.1
(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 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 loading 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 accounting 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”

Electrical connections
Electrical connection selectable between lateral (left/right) or top

Delivery
Heat pump on pallet, plastic hood and floor plate separately packed. Hose sleeves, clamps and sensor set included separately

Option
- Drive motor for 3-way switch ball valve with flexible hose 1″
- internet connection

Part No.

Brine/water-water/water heat pump

Energy efficiency class
see Description

Brine/water-water/water heat pump with hermetic spiral (scroll) compressor for indoor installation with flexible connection pipes and built-in Hoval TopTronic® E control

Control functions integrated for
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- bivalent and cascade management

- Can be optionally expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion universal
  - module expansion heat accounting
- Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Delivery
- Compact device internally wired ready for installation
- Heat pump on pallet, plastic hood and floor plate separately packed
- Hose sleeves, clamps and sensor set included separately
- Flexible hoses (removable to the left, right or top)

Hoval Thermalia® comfort

Refrigerant R410A
Flow temperature max. 62 °C

Thermalia® comfort Type	Heat output with B0W35 kW	Heat output with W10W35 kW	Part No.
(6)	5.8	7.1	7014 715
(8)	7.6	9.6	7014 716
(10)	10.6	12.7	7014 717
(13)	13.4	17.5	7014 718
(17)	17.2	22.3	7014 719

Hoval Thermalia® comfort H

Refrigerant R134a
Flow temperature max. 67 °C

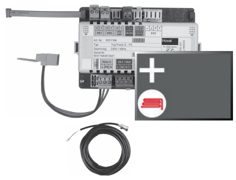
Thermalia® comfort Type	Heat output with B0W35 kW	Heat output with W10W35 kW	Part No.
(7)	6.5	9.1	7014 721
(10)	9.1	12.8	7014 722

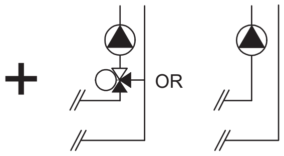
Suitable plate heat exchanger
see chapter “plate heat exchanger for Hoval Thermalia®”

Part No.

TopTronic® E module expansions

for TopTronic® E basic module heat generator





TopTronic® E module expansion heating circuit TTE-FE HK

6034 576

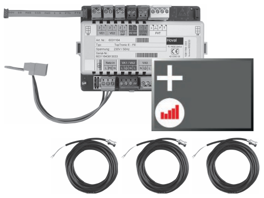
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

6037 062

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

in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

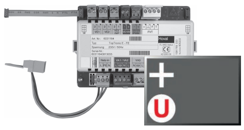
Flow rate sensor sets

Plastic housing

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



TopTronic® E module expansion Universal TTE-FE UNI

6034 575

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

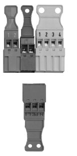
incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

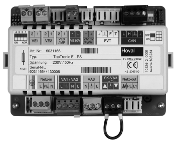
Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

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

Accessories for TopTronic® E



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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

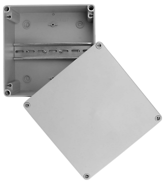
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

2018 837

Accessories for water heating

Hot water set SW25-32-10-1MB
for Thermalia® comfort (6-17),
comfort H (7,10)
Consisting of:
Motor drive LRA 230A for integrated
switching valve and flexible
connecting hose 1″

6026 251

System water protection filter
Type: 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 loss.
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 Rp2″: Internal thread with integrated shut-off valves and union connection (outlet)

Max. flow rate: (∆p<0.1 bar): 7.2 m³/h
Weight: 6.9 kg
Water temperature: max. 90 °C

2076 375

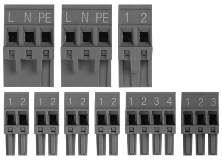
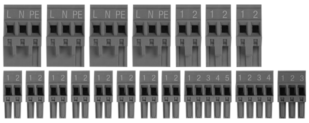
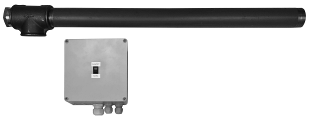
Notice:
Fulfills the function of sludge separator and strainer

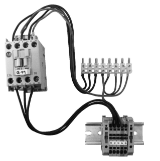
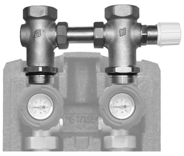
Further strainers
see “Various system components”

El. continuous-flow heater available on request

Screw-in electrical heating inset
for plants with energy buffer storage tank as emergency heating.

Type	Heat output [kW]	Installation depth [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560

		Part No.
	**Expansion connector set** for the automatic heat pump 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: - 1x 230V digital input - 2x 230V outputs - 4x low-voltage inputs - 1x ratio. Input	6032 509
	**Universal connector set** for automatic heat pump ECR461 Plugs: - 3x 230V digital input - 4x 230V outputs - 6x low-voltage inputs - 2x low-voltage outputs - 1x ratio. input - 1x electr. expansion valve	6032 510
	Necessary at boiler room temperatures < 10 °C	
	**Crankcase heater** for Belaria® twin I, twin IR, Thermalia® comfort, Thermalia® twin for compressor protection For Belaria® twin I, twin IR 2 pieces are necessary!	6019 718
	**Instantaneous water heater kit DN 50** from ready electrical box for electrical protection incl. assembly fittings. for combination with all screw-in heating inset EP. Screw-in heaters must be ordered separately.	6044 070

		Part No.
	**Freeze 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
	**Float ball flow switch** area of application 300-3000 l/h, 0-80 °C, nominal pressure 10 bar connection Rp 1½″ installed length 335 mm bistable reed contact as normally open contact	2040 707
	**Float ball flow switch** area of application 600-6000 l/h, 0-80 °C, nominal pressure 10 bar connection Rp 1½″ installed length 335 mm bistable reed contact as normally open contact	2040 708
	**Ground water pump kit SB-GWP** for Thermalia® comfort (6-17), comfort H (7,10) Contactor for actuation of a 3-phase ground water pump. Ready to connect without thermal overload protection	6025 513
	**Bypass valve DN 32 (1¼″)** for the installation in a HA group DN 32 Setting range 0.6-1.5 bar Max. flow rate: 1.5 m³/h with self-sealing screw connection for mounting between flow and return ball valve	6014 849

		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 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 Max. operating pressure 1.0 MPa (10 bar) Dirt screen integrated	6033 364
	**Immersion sensor TF/2P/2.5/6T, L = 2.5 m** for TopTronic® E controller modules/ module expansions with exception of basic module district heating/fresh water or basic module district heating com, cable length: 2.5 m without plug sensor sleeve diameter: 6 x 50 mm, dewpoint-proof, sensor may already be included in scope of delivery of heat generator/controller module/module expansion, operating temperature: -20…105 °C, index of protection: IP67	2056 789

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 (6-17) with R410A

Type			(6)	(8)	(10)	(13)	(17)
Seasonal coefficient of performance moderate climate (brine) 35 °C /55 °C		SCOP	4.4/3.2	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 [1]	5.83	7.56	10.58	13.36	17.18
• Power consumption B0W35		kW [1]	1.31	1.66	2.20	2.78	3.64
• Coefficient of performance B0W35		COP	4.45	4.55	4.81	4.81	4.72
• Heat output W10W35		kW [1]	7.11	9.63	12.71	17.52	22.34
• Power consumption W10W35		kW [1]	1.31	1.64	2.09	2.79	3.80
• Coefficient of performance W10W35		COP	5.43	5.87	6.08	6.28	5.88
• Operating weight	approx.	kg	140	150	160	170	180
• Compressor type					1 x spiral (scroll), hermetic		
• Refrigerant filling R410A		kg	1.3	1.6	1.85	2.12	2.4
• Condenser/evaporator					Plate heat exchanger		
Material					Stainless steel V4A, AISI 316, 1.4401		
Piping connections with flex. connecting hose		G	1″	1″	1″	1″	1″
Nominal volume flow and resistance brine/water heat pump							
• *Heating* (ΔT = 5 K)		m^3/h	1.01	1.30	1.82	2.30	2.96
ΔP Pressure drop condenser		kPa	6.2	6.7	8.3	9.2	10.2
Residual overpressure		kPa	69	68	57	67	62
• *Heat source* (ΔT = 3.5 K)		m^3/h	1.26	1.65	2.34	2.96	3.78
ΔP Pressure drop evaporator (glycol)		kPa	11.3	12.9	16.5	20.4	16.2
Residual overpressure		kPa	60	63	55	94	98
Nominal volume flow and resistance water/water heat pump							
• *Heating* (ΔT = 5 K)		m^3/h	1.23	1.66	2.19	3.02	3.85
ΔP Pressure drop condenser		kPa	9.2	10.9	11.9	15.8	14.1
Residual overpressure		kPa	62	55	45	59	52
• *Heat source* (ΔT = 5 K) [5]		m^3/h	1.0	1.38	1.83	2.54	2.84
ΔP Pressure drop evaporator		kPa	9.3	10.6	13.5	16.7	13.2
Residual overpressure		kPa	68	72	80	108	110
• Operating pressure max.							
- Water side		bar			6		
- Brine side		bar			6		
Operating limit values							
• *Ranges of application for heating and see diagrams.*							
• *Ranges of application for heating and hot water see diagrams*							
• Installation place operation [4]	min./max.	°C			5/35		
Storage	min./max.	°C			-15/50		
Electrical data [3]							
Voltage		V			3 x 400		
Frequency		Hz			50		
Voltage range		V			380-420		
Operating pressure compressor Imax		A	4.8	6.2	7.4	9.7	13.0
Starting current with starting current limiter [2]		A	9.6	12.4	14.8	19.4	26.0
Principal current (external protection) with brine systems		A	13	13	13	13	16
		Type	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
Principal current (external protection) with ground water systems		A	13	13	13	13	16
		Type	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
Control current (external protection)		A	13	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	B,C,D,K,Z

[1] kW = Standard values according to EN 14511; Values for B0W35 with 25 % monopolypropylene

[2] Effective value

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

[4] <10 °C Crankcase heater is necessary

[5] 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® comfort H (7,10) with R134a

Type			H (7)	H (10)
Seasonal coefficient of performance moderate climate 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 [1]	6.5	9.1
• Power consumption B0W35		kW [1]	1.4	2.0
• Coefficient of performance B0W35		COP	4.50	4.6
• Heat output W10W35		kW [1]	9.1	12.8
• Power consumption W10W35		kW [1]	1.6	2.1
• Coefficient of performance W10W35		COP	5.90	6.0
• Operating weight	approx.	kg	160	180
• Compressor type			1 x spiral (scroll), hermetic	
• Refrigerant filling R134a		kg	2.75	3.4
• Condenser/evaporator			Plate heat exchanger	
Material			Stainless steel V4A, AISI 316, 1.4401	
Piping connections with flex. connecting hose		G	1″	1″
Nominal volume flow and resistance brine/water heat pump				
• *Heating* (ΔT = 5 K)		m^3/h	1.14	1.61
ΔP Pressure drop condenser		kPa	6.0	7.0
Residual overpressure		kPa	69	63
• *Heat source (ΔT = 3.5 K)*		m^3/h	1,47	2,07
ΔP Pressure drop evaporator		kPa	12,5	16,2
Residual overpressure		kPa	59	60
Nominal volume flow and resistance water/water heat pump				
• *Heating* (ΔT = 5 K)		m^3/h	1.6	2.25
ΔP Pressure drop condenser		kPa	13.0	14.0
Residual overpressure		kPa	57	41
• *Heat source* (ΔT = 5 K) [5]		m^3/h	1.34	1.89
ΔP Pressure drop evaporator		kPa	7.49	9.7
Residual overpressure		kPa	68	70
• Operating pressure max.				
- Water side		bar	6	
- Brine side		bar	6	
Operating limit values				
• *Ranges of application for heating see diagrams.*				
• *Ranges of application for heating and hot water see diagrams*				
• Installation place operation [4]	min./max.	°C	5/35	
Storage	min./max.	°C	-15/50	
Electrical data [3]				
Voltage		V	3 x 400	
Frequency		Hz	50	
Voltage range		V	380-420	
Operating pressure compressor Imax		A	6.8	10.1
Starting current with starting current limiter [2]		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

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

[2] Effective value

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

[4] <10 °C crankcase heater is necessary

[5] 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® comfort (6-17), comfort H (7,10)

Sound emission

The effective sound pressure level [1] in the installation room is dependent on different factors like room size, absorptive capacity, reflection, free sound spreading 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.

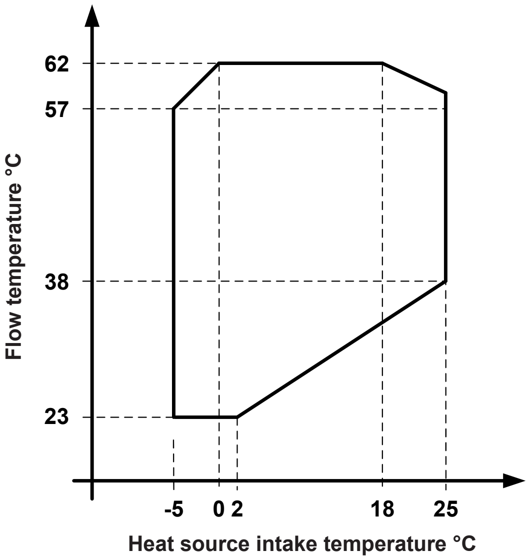
Thermalia® comfort (6-17) Thermalia® comfort H	(6)	(8)	(10) (7)	(13)	(17) (10)
Sound power level dB(A)	45	46	46	49	50
Sound pressure level dB(A) [1]	35	35	36	37	38

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

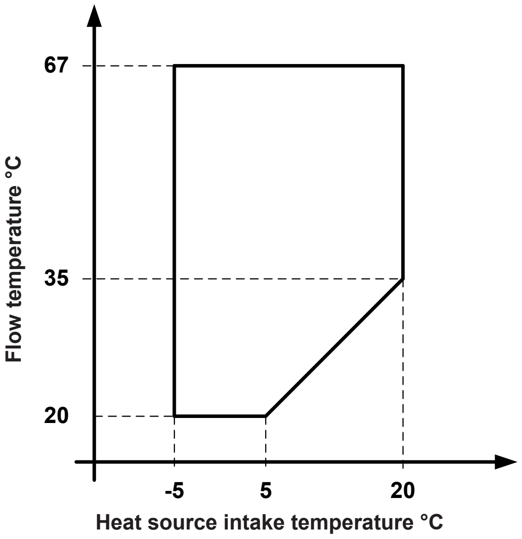
Diagrams range of application

Heating and hot water

Thermalia® comfort (6-17)



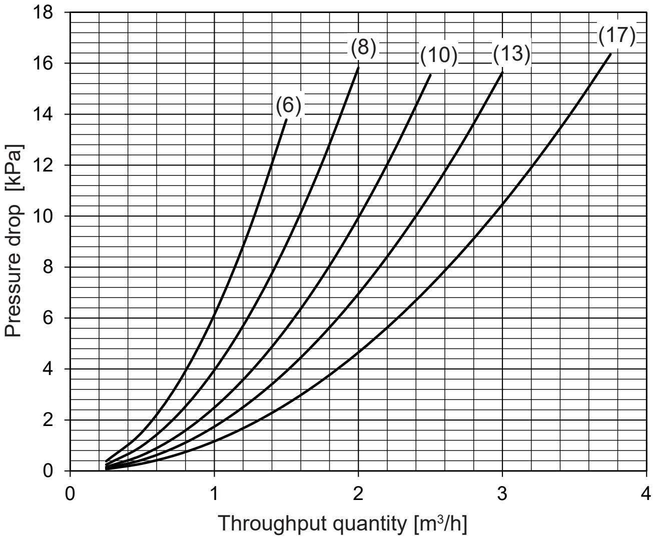
Thermalia® comfort H (7,10)



Thermalia® comfort (6-17)

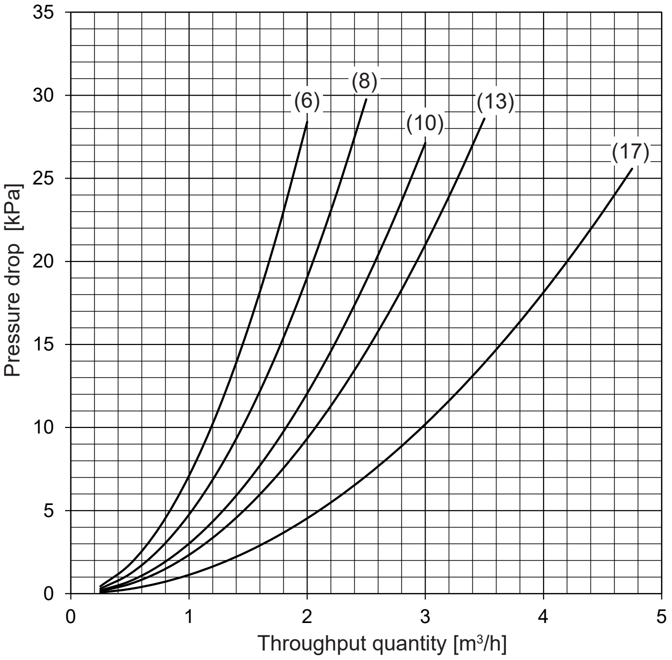
Heating

Pressure drop condenser with water



Heat source

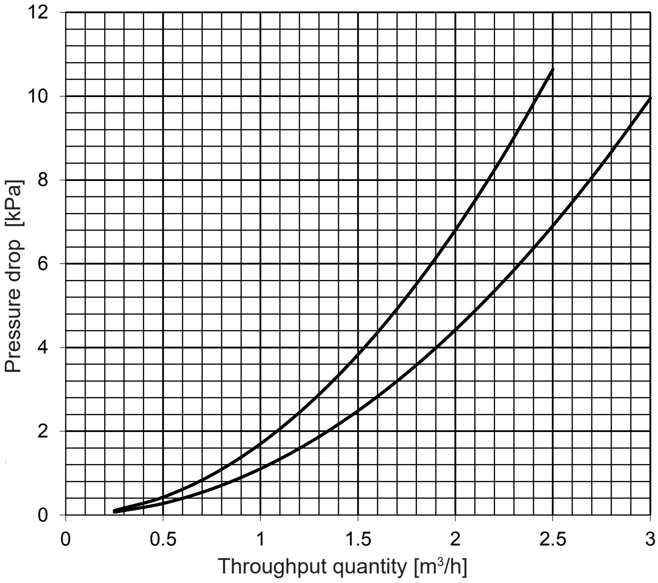
Pressure drop evaporator with ethylene glycol 25 % (Antifrogen N)



Thermalia® comfort H (7,10)

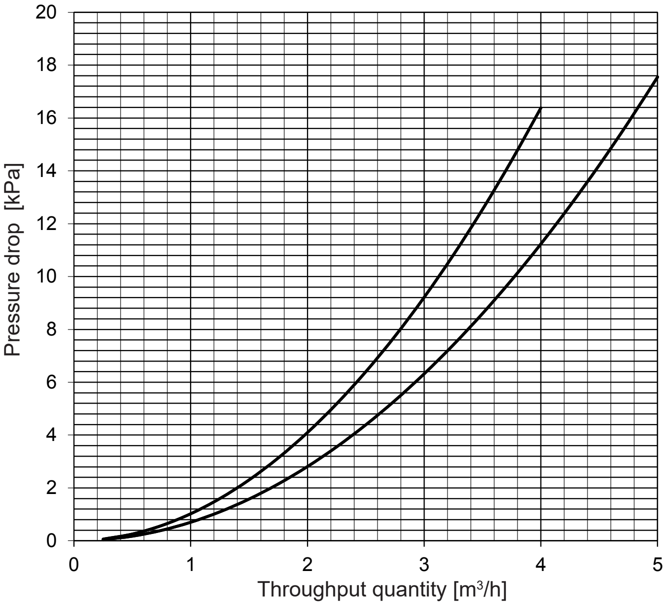
Heating

Pressure drop condenser with water



Heat source

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



Refrigeration capacity

$$\boxed{Q_0 = Q - P}$$

Q_0 = Refrigeration capacity (kW)
Q = Heat output (kW)
P = Power consumption compressor (kW)
Δt_2 = Temperature difference heat source supply/discharge (K)
C = 0.86
c_p = 0.89 (specific heat)
γ = 1.05 (specific weight, density)

Volume flow evaporator

$$\boxed{V = \frac{Q_0 \cdot c}{\Delta t_2 \cdot c_p \cdot \gamma} \ (\mathrm{m^3/h})}$$

Δp (kPa) = Pressure drop with frost protection (1 kPa = 0.1 mWC)
Δp = f x ΔP

f	Ethylene glycol % (Antifrogen N)
0.97	≙ 20 %
1	≙ 25 %
1.03	≙ 30 %

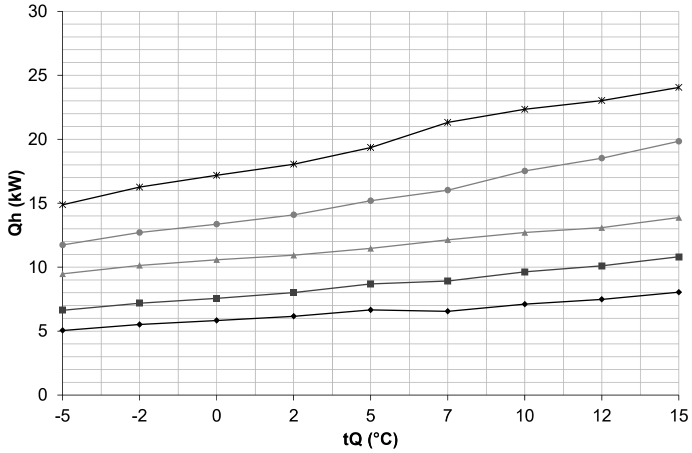
Δp_w (kPa) = Pressure drop with water (1 kPa = 0.1 mWC)
Δp_w = ΔP x 0.89

Performance data - heating

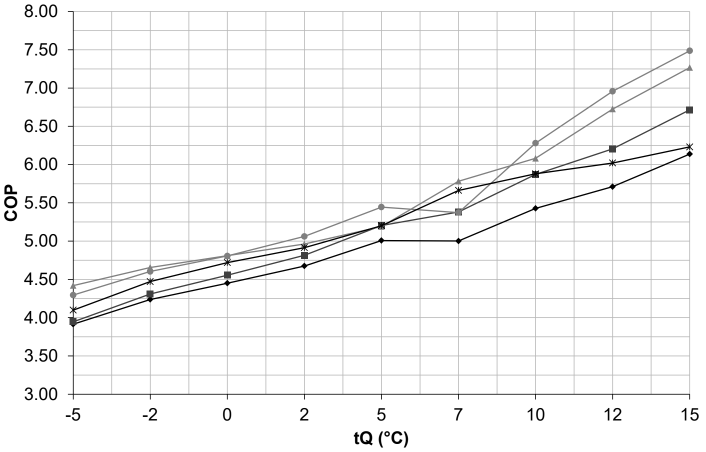
Maximum heat output

Thermalia® comfort (6-17)

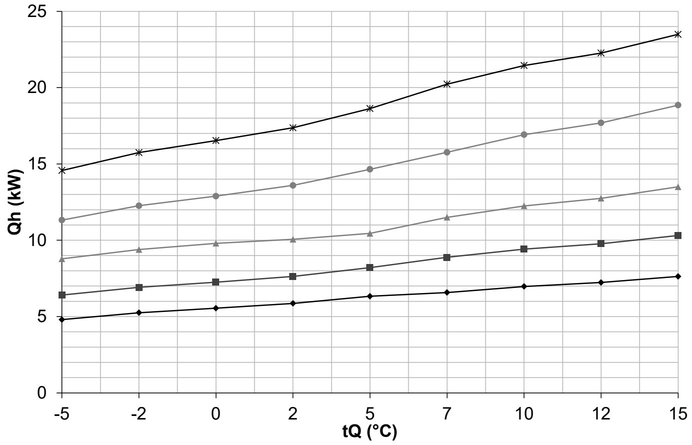
Heat output - t_{VL} 35 °C



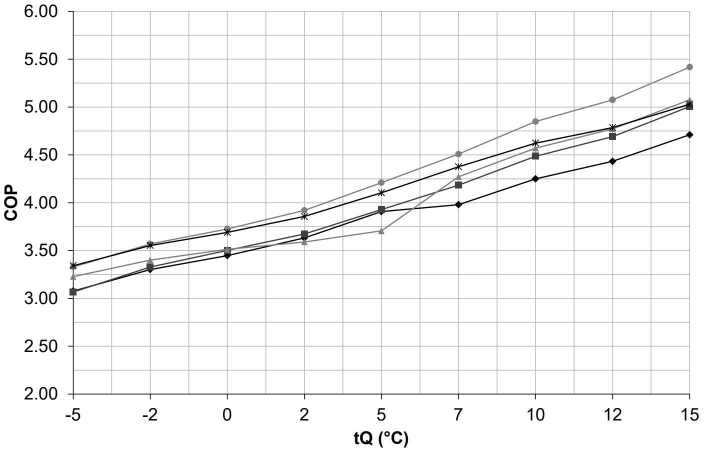
Output rating - t_{VL} 35 °C



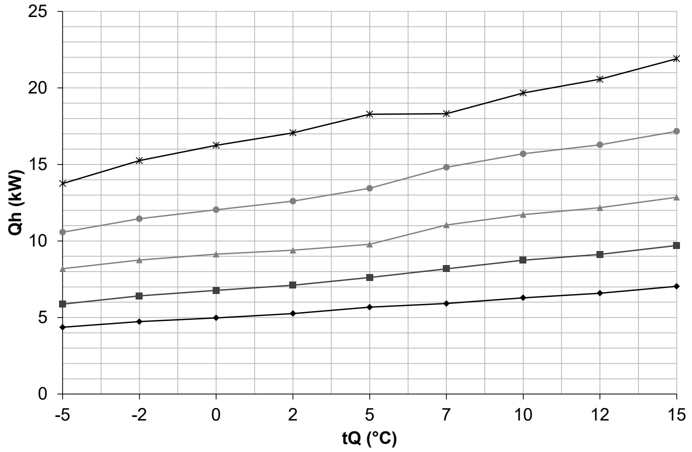
Heat output - t_{VL} 45 °C



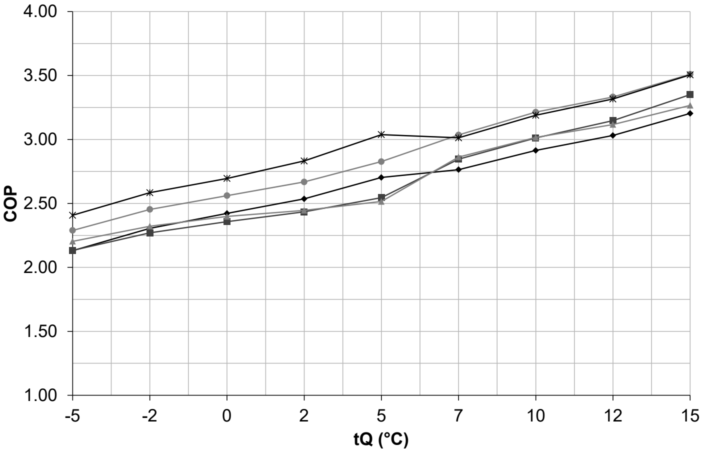
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Output rating - t_{VL} 62 °C



◆ Thermalia® comfort (6)
■ Thermalia® comfort (8)
▲ Thermalia® comfort (10)
● Thermalia® comfort (13)
× Thermalia® comfort (17)

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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 (6-17)

Indications acc. to EN 14511

Type				(6)			(8)			(10)			(13)			(17)	
tVL °C		tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
30	Brine	-5	5.1	1.2	4.28	6.7	1.5	4.34	9.7	2.0	4.97	11.9	2.5	4.73	15.0	3.4	4.42
		-2	5.6	1.2	4.65	7.3	1.5	4.75	10.4	2.0	5.24	12.9	2.5	5.07	16.4	3.4	4.87
		0	5.9	1.2	4.90	7.7	1.5	5.03	10.8	2.0	5.41	13.5	2.6	5.29	17.4	3.4	5.18
		2	6.3	1.2	5.14	8.1	1.5	5.33	11.2	2.0	5.60	14.3	2.6	5.58	18.3	3.4	5.38
		5	6.8	1.2	5.49	8.9	1.5	5.78	11.8	2.0	5.89	15.4	2.6	6.00	19.6	3.4	5.68
	Water	7	6.5	1.2	5.47	8.9	1.5	5.95	12.4	1.9	6.49	16.1	2.7	5.97	21.7	3.5	6.23
		10	7.2	1.2	5.96	9.7	1.5	6.52	12.9	1.9	6.79	17.7	2.6	6.93	22.6	3.5	6.43
		12	7.6	1.2	6.29	10.2	1.5	6.92	13.2	1.7	7.75	18.8	2.4	7.87	23.3	3.5	6.56
		15	8.2	1.2	6.78	11.0	1.5	7.52	14.0	1.7	8.44	20.2	2.4	8.50	24.2	3.6	6.75
35	Brine	-5	5.1	1.3	3.91	6.6	1.7	3.95	9.5	2.1	4.42	11.7	2.7	4.29	14.9	3.6	4.10
		-2	5.5	1.3	4.24	7.2	1.7	4.31	10.1	2.2	4.66	12.7	2.8	4.60	16.3	3.6	4.47
		0	5.8	1.3	4.45	7.6	1.7	4.55	10.6	2.2	4.81	13.4	2.8	4.81	17.2	3.6	4.72
		2	6.2	1.3	4.68	8.0	1.7	4.81	10.9	2.2	4.96	14.1	2.8	5.06	18.0	3.7	4.92
		5	6.7	1.3	5.01	8.7	1.7	5.20	11.5	2.2	5.19	15.2	2.8	5.44	19.4	3.7	5.20
	Water	7	6.6	1.3	5.00	8.9	1.7	5.38	12.1	2.1	5.78	16.0	3.0	5.37	21.3	3.8	5.66
		10	7.1	1.3	5.43	9.6	1.6	5.87	12.7	2.1	6.08	17.5	2.8	6.28	22.3	3.8	5.88
		12	7.5	1.3	5.71	10.1	1.6	6.21	13.1	1.9	6.73	18.5	2.7	6.96	23.0	3.8	6.02
		15	8.0	1.3	6.14	10.8	1.6	6.71	13.9	1.9	7.27	19.8	2.7	7.49	24.1	3.9	6.23
40	Brine	-5	4.9	1.4	3.46	6.5	1.9	3.46	9.1	2.4	3.75	11.5	3.1	3.76	14.7	4.0	3.69
		-2	5.4	1.4	3.72	7.1	1.9	3.76	9.8	2.5	3.95	12.5	3.1	4.03	16.0	4.0	3.97
		0	5.7	1.5	3.90	7.4	1.9	3.97	10.2	2.5	4.08	13.1	3.1	4.21	16.9	4.1	4.15
		2	6.0	1.5	4.10	7.8	1.9	4.18	10.5	2.5	4.19	13.8	3.1	4.43	17.7	4.1	4.33
		5	6.5	1.5	4.40	8.5	1.9	4.49	11.0	2.5	4.36	14.9	3.1	4.76	19.0	4.1	4.60
	Water	7	6.6	1.5	4.43	8.9	1.9	4.71	11.8	2.4	4.93	15.9	3.2	4.91	20.8	4.2	4.95
		10	7.0	1.5	4.77	9.5	1.9	5.09	12.5	2.4	5.23	17.2	3.1	5.48	21.9	4.2	5.19
		12	7.4	1.5	5.00	9.9	1.9	5.36	12.9	2.3	5.60	18.1	3.1	5.89	22.6	4.2	5.34
		15	7.8	1.5	5.35	10.6	1.8	5.75	13.7	2.3	5.99	19.3	3.1	6.31	23.8	4.3	5.57
45	Brine	-5	4.8	1.6	3.08	6.4	2.1	3.07	8.8	2.7	3.23	11.3	3.4	3.33	14.6	4.4	3.34
		-2	5.3	1.6	3.30	6.9	2.1	3.33	9.4	2.8	3.40	12.3	3.4	3.57	15.7	4.4	3.55
		0	5.6	1.6	3.45	7.3	2.1	3.50	9.8	2.8	3.51	12.9	3.5	3.73	16.5	4.5	3.69
		2	5.9	1.6	3.63	7.6	2.1	3.67	10.1	2.8	3.59	13.6	3.5	3.92	17.4	4.5	3.86
		5	6.3	1.6	3.91	8.2	2.1	3.93	10.5	2.8	3.71	14.7	3.5	4.21	18.6	4.5	4.10
	Water	7	6.6	1.7	3.98	8.9	2.1	4.18	11.5	2.7	4.27	15.8	3.5	4.51	20.2	4.6	4.38
		10	7.0	1.6	4.25	9.4	2.1	4.49	12.3	2.7	4.57	16.9	3.5	4.85	21.5	4.6	4.62
		12	7.2	1.6	4.43	9.8	2.1	4.69	12.8	2.7	4.77	17.7	3.5	5.08	22.3	4.7	4.79
		15	7.6	1.6	4.71	10.3	2.1	5.00	13.5	2.7	5.08	18.9	3.5	5.42	23.5	4.7	5.03
50	Brine	-5	4.7	1.7	2.73	6.2	2.3	2.71	8.6	3.0	2.86	11.1	3.8	2.95	14.3	4.8	2.97
		-2	5.1	1.7	2.92	6.7	2.3	2.93	9.2	3.1	3.01	12.0	3.8	3.17	15.6	4.9	3.18
		0	5.4	1.8	3.04	7.1	2.3	3.07	9.6	3.1	3.11	12.6	3.8	3.30	16.4	5.0	3.32
		2	5.7	1.8	3.20	7.4	2.3	3.21	9.9	3.1	3.17	13.3	3.8	3.47	17.3	5.0	3.47
		5	6.2	1.8	3.44	8.0	2.3	3.42	10.3	3.1	3.27	14.3	3.9	3.71	18.6	5.0	3.69
	Water	7	6.4	1.8	3.54	8.6	2.4	3.63	11.4	3.0	3.74	15.5	3.9	3.97	19.6	5.1	3.83
		10	6.8	1.8	3.75	9.2	2.4	3.88	12.1	3.0	3.99	16.6	3.9	4.25	20.9	5.1	4.06
		12	7.1	1.8	3.90	9.5	2.4	4.05	12.6	3.0	4.15	17.3	3.9	4.43	21.7	5.2	4.20
		15	7.5	1.8	4.11	10.1	2.3	4.30	13.3	3.0	4.39	18.4	3.9	4.71	23.0	5.2	4.42
55	Brine	-5	4.5	1.9	2.44	5.9	2.5	2.40	8.4	3.3	2.55	10.9	4.1	2.64	14.0	5.3	2.66
		-2	4.9	1.9	2.60	6.5	2.5	2.59	9.0	3.4	2.69	11.8	4.2	2.83	15.4	5.4	2.87
		0	5.2	1.9	2.70	6.9	2.5	2.72	9.4	3.4	2.78	12.4	4.2	2.96	16.3	5.4	3.01
		2	5.5	1.9	2.84	7.2	2.6	2.83	9.7	3.4	2.83	13.0	4.2	3.09	17.2	5.5	3.15
		5	6.0	2.0	3.05	7.8	2.6	3.00	10.1	3.5	2.92	13.9	4.2	3.30	18.5	5.5	3.35
	Water	7	6.3	2.0	3.18	8.4	2.6	3.19	11.2	3.4	3.33	15.2	4.3	3.53	19.0	5.6	3.39
		10	6.7	2.0	3.35	8.9	2.6	3.40	11.9	3.4	3.52	16.2	4.3	3.76	20.3	5.7	3.59
		12	6.9	2.0	3.46	9.3	2.6	3.54	12.4	3.4	3.65	16.9	4.3	3.91	21.1	5.7	3.72
		15	7.3	2.0	3.63	9.9	2.6	3.75	13.1	3.4	3.85	17.9	4.3	4.14	22.4	5.7	3.92
62	Brine	-5	4.4	2.0	2.13	5.9	2.8	2.13	8.2	3.7	2.20	10.6	4.6	2.29	13.8	5.7	2.41
		-2	4.7	2.1	2.31	6.4	2.8	2.27	8.8	3.8	2.32	11.5	4.7	2.45	15.3	5.9	2.58
		0	5.0	2.1	2.42	6.8	2.9	2.36	9.1	3.8	2.40	12.0	4.7	2.56	16.3	6.0	2.70
		2	5.3	2.1	2.54	7.1	2.9	2.43	9.4	3.8	2.45	12.6	4.7	2.67	17.1	6.0	2.83
		5	5.7	2.1	2.70	7.6	3.0	2.54	9.8	3.9	2.52	13.4	4.8	2.83	18.3	6.0	3.04
	Water	7	5.9	2.1	2.76	8.2	2.9	2.85	11.0	3.9	2.86	14.8	4.9	3.04	18.3	6.1	3.01
		10	6.3	2.2	2.91	8.7	2.9	3.01	11.7	3.9	3.02	15.7	4.9	3.21	19.7	6.2	3.19
		12	6.6	2.2	3.03	9.1	2.9	3.15	12.2	3.9	3.12	16.3	4.9	3.33	20.6	6.2	3.32
		15	7.0	2.2	3.20	9.7	2.9	3.35	12.9	3.9	3.27	17.2	4.9	3.51	21.9	6.2	3.51

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

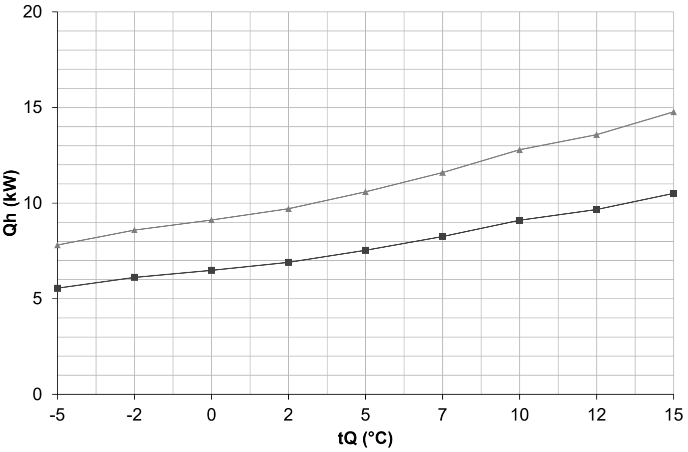
Observe daily power interruptions!
see "Engineering heat pumps general"

Performance data - heating

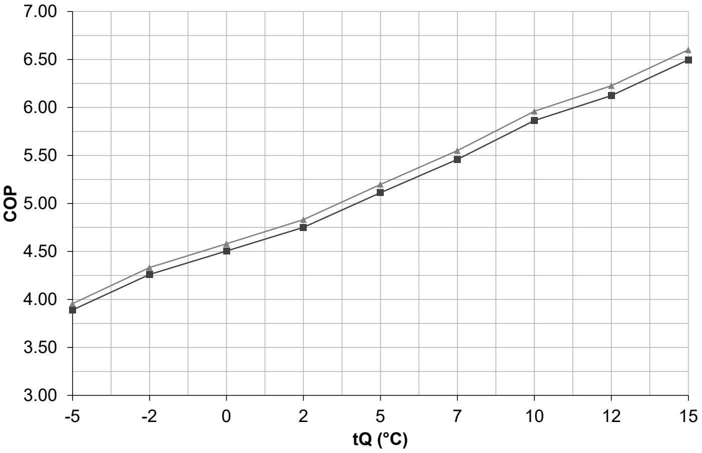
Maximum heat output

Thermalia® comfort H (7,10)

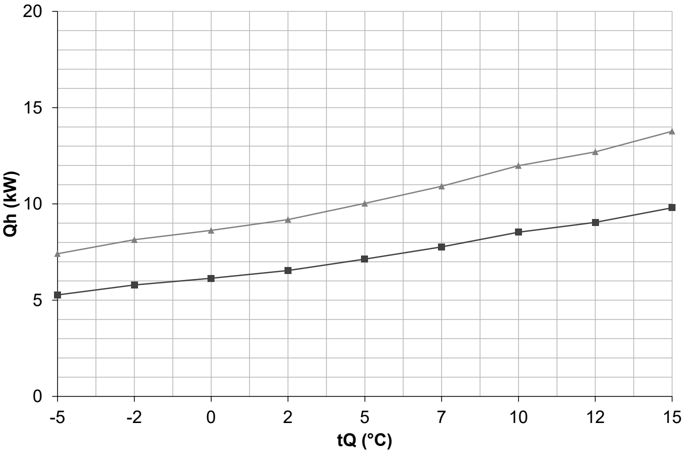
Heat output - t_{VL} 35 °C



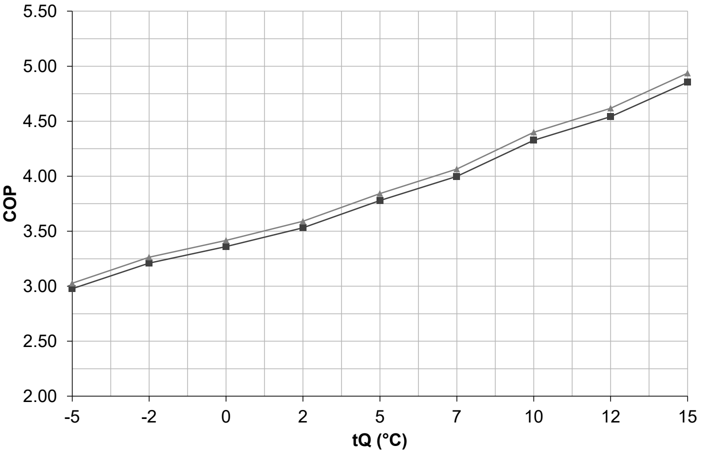
Output rating - t_{VL} 35 °C



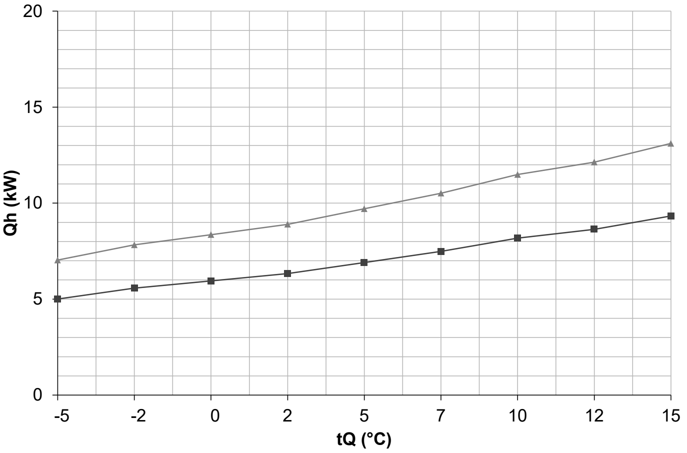
Heat output - t_{VL} 50 °C



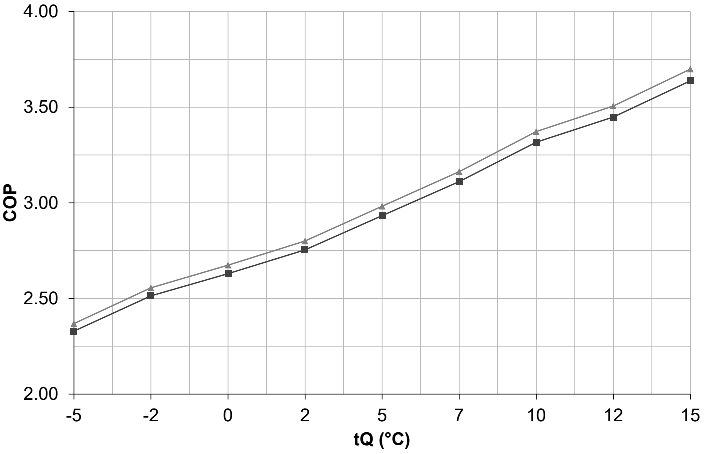
Output rating - t_{VL} 50 °C



Heat output - t_{VL} 65 °C



Output rating - t_{VL} 65 °C



tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

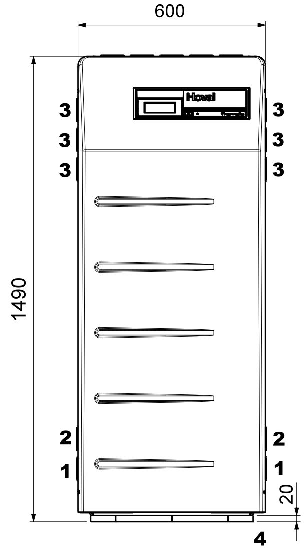
Type tVL °C		tQ °C	H (7) Qh kW	H (7) P kW	H (7) COP	H (10) Qh kW	H (10) P kW	H (10) COP
30	Brine	-5	5.6	1.4	4.16	7.9	1.9	4.23
		-2	6.2	1.4	4.58	8.7	1.9	4.65
		0	6.6	1.4	4.86	9.2	1.9	4.94
		2	7.0	1.4	5.13	9.8	1.9	5.21
		5	7.6	1.4	5.53	10.7	1.9	5.62
	Water	7	8.4	1.4	5.92	11.8	2.0	6.02
		10	9.3	1.5	6.33	13.0	2.0	6.44
		12	9.8	1.5	6.59	13.8	2.1	6.70
		15	-	-	-	-	-	-
35	Brine	-5	5.6	1.4	3.89	7.8	2.0	3.96
		-2	6.1	1.4	4.26	8.6	2.0	4.33
		0	6.5	1.4	4.50	9.1	2.0	4.58
		2	6.9	1.5	4.75	9.7	2.0	4.83
		5	7.5	1.5	5.11	10.6	2.0	5.20
	Water	7	8.3	1.5	5.46	11.6	2.1	5.55
		10	9.1	1.6	5.86	12.8	2.1	5.96
		12	9.7	1.6	6.12	13.6	2.2	6.23
		15	10.5	1.6	6.50	14.8	2.2	6.60
40	Brine	-5	5.5	1.5	3.54	7.7	2.1	3.60
		-2	6.0	1.6	3.85	8.4	2.2	3.91
		0	6.3	1.6	4.05	8.9	2.2	4.12
		2	6.8	1.6	4.26	9.5	2.2	4.33
		5	7.4	1.6	4.58	10.4	2.2	4.65
	Water	7	8.1	1.7	4.86	11.3	2.3	4.94
		10	8.9	1.7	5.26	12.5	2.3	5.35
		12	9.4	1.7	5.52	13.2	2.4	5.61
		15	10.2	1.7	5.89	14.4	2.4	5.99
45	Brine	-5	5.4	1.7	3.24	7.5	2.3	3.37
		-2	5.9	1.7	3.49	8.2	2.3	3.55
		0	6.2	1.7	3.66	8.7	2.3	3.72
		2	6.6	1.7	3.85	9.3	2.4	3.91
		5	7.2	1.7	4.13	10.1	2.4	4.20
	Water	7	7.9	1.8	4.36	11.1	2.5	4.43
		10	8.7	1.8	4.75	12.2	2.5	4.81
		12	9.2	1.8	5.00	12.9	2.5	5.08
		15	10.0	1.9	5.37	14.0	2.6	5.45
50	Brine	-5	5.3	1.8	2.98	7.4	2.4	3.03
		-2	5.8	1.8	3.21	8.1	2.5	3.26
		0	6.1	1.8	3.36	8.6	2.5	3.42
		2	6.5	1.9	3.53	9.2	2.6	3.59
		5	7.1	1.9	3.78	10.0	2.6	3.84
	Water	7	7.8	1.9	4.00	10.9	2.7	4.07
		10	8.5	2.0	4.33	12.0	2.7	4.40
		12	9.0	2.0	4.54	12.7	2.8	4.62
		15	9.8	2.0	4.86	13.8	2.8	4.94
55	Brine	-5	5.2	1.9	2.75	7.3	2.6	2.79
		-2	5.7	1.9	2.96	8.0	2.7	3.01
		0	6.1	2.0	3.10	8.5	2.7	3.15
		2	6.5	2.0	3.26	9.1	2.7	3.31
		5	7.1	2.0	3.48	9.9	2.8	3.54
	Water	7	7.7	2.1	3.68	10.8	2.9	3.75
		10	8.4	2.1	3.97	11.8	2.9	4.01
		12	8.9	2.1	4.15	12.5	3.0	4.22
		15	9.6	2.2	4.42	13.5	3.0	4.49
62	Brine	-5	5.1	2.1	2.44	7.1	2.9	2.48
		-2	5.6	2.1	2.64	7.9	2.9	2.68
		0	6.0	2.2	2.76	8.4	3.0	2.80
		2	6.4	2.2	2.89	9.0	3.0	2.94
		5	7.0	2.3	3.08	9.8	3.1	3.13
	Water	7	7.5	2.3	3.27	10.6	3.2	3.32
		10	8.2	2.4	3.49	11.6	3.3	3.55
		12	8.7	2.4	3.64	12.2	3.3	3.70
		15	9.4	2.4	3.85	13.2	3.4	3.91
65	Brine	-5	5.0	2.1	2.33	7.0	3.0	2.37
		-2	5.6	2.2	2.51	7.8	3.1	2.56
		0	5.9	2.3	2.63	8.4	3.1	2.67
		2	6.3	2.3	2.75	8.9	3.2	2.80
		5	6.9	2.4	2.93	9.7	3.3	2.98
	Water	7	7.5	2.4	3.11	10.5	3.3	3.16
		10	8.2	2.5	3.32	11.5	3.4	3.37
		12	8.6	2.5	3.45	12.1	3.5	3.51
		15	9.3	2.6	3.64	13.1	3.5	3.70
		25	-	-	-	-	-	-

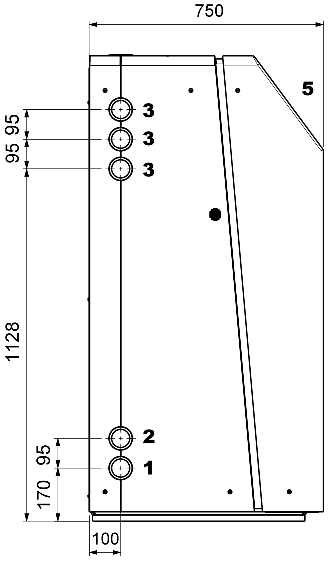
tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = heat output at full load (kW), measured in accordance with standard EN 14511
P = power consumption of the overall unit (kW)
COP = Coefficient of Performance for the overall unit in accordance with standard EN 14511

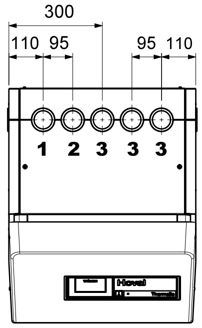
Observe daily power interruptions!
see “Engineering heat pumps general”

Thermalia® comfort (6-17) and comfort H (7,10)

(Dimensions in mm)







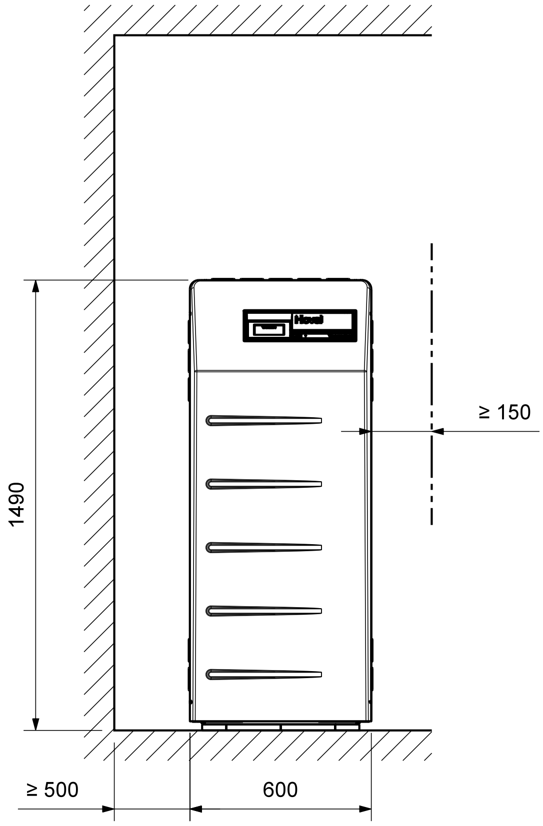
1 Heat source - outlet R1″ (selectable lateral or above)
2 Heat source - inlet R1″ (selectable lateral or above)
3 Openings freely selectable for:
  - heating flow R1″
  - heating return R1″
  - hot water R1″ (left or above)
  - electrical connection
4 Vibration damping
5 Control panel

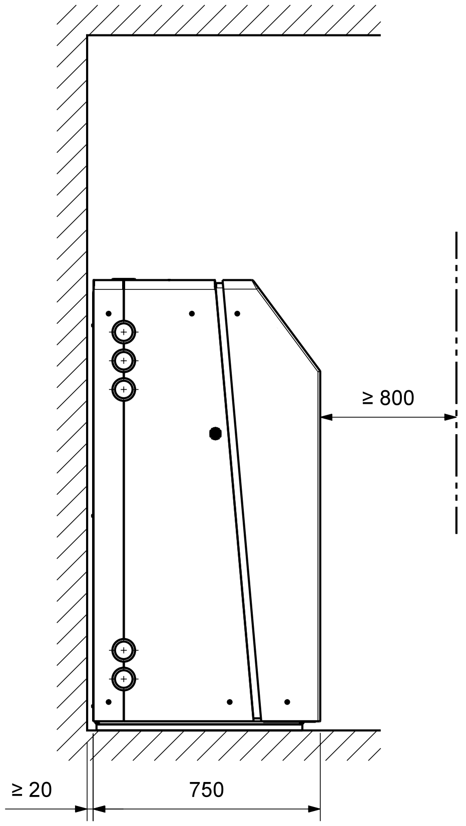
The 4 flexible hoses 1″ can be extracted from the heat pump by at least 30 cm

Required space

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

front	rear	right or left side
min. 800	min. 20	min. 500

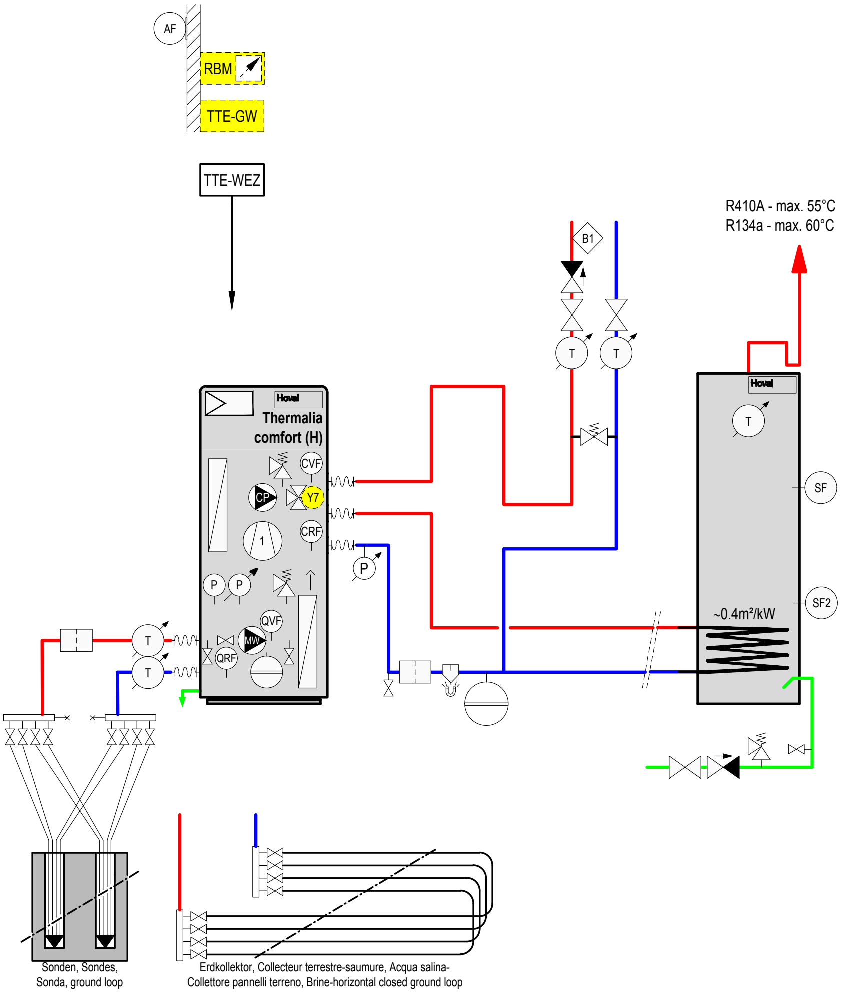




Thermalia® comfort (6-17), comfort H (7,10)

Brine/water-water/water heat pump with
- earth probes
- calorifier
- 1 direct circuit

Hydraulic schematic BBBAE020



Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
B1	Flow temperature guard (if required)
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2

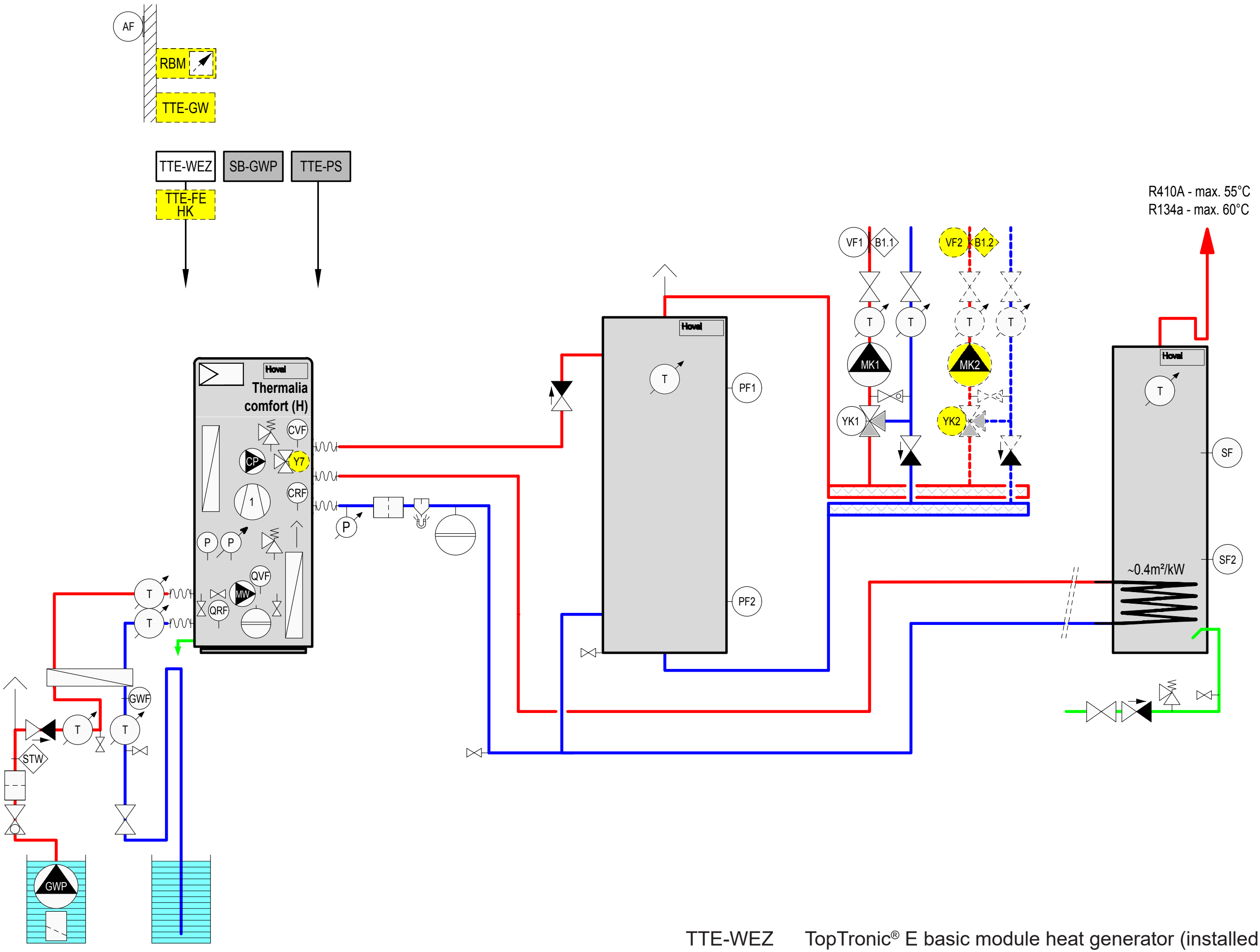
Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
Y7	Switching valve

Thermalia® comfort (6-17), comfort H (7,10)

Brine/water-water/water heat pump with
- water/water - indirect utilisation
- energy buffer storage tank
- calorifier
- 1-... mixer circuit(s)

Hydraulic schematic BBBAE070



TTE-WEZ	TopTronic® E basic module heat generator (installed)
SB-GWP	System module ground water pump
TTE-PS	TopTronic® E buffer module
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
PF1	Buffer sensor 1
PF2	Buffer sensor 2
GWF	Frost controller
STW	Flow controller
GWP	Ground water pump

Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

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
- 4 flexible hoses incl. 90° bend (included separately)
  Thermalia® twin (20,26): 1½″ 4x 1 m
  Thermalia® twin (35,42): 2″ 4x 1 m
  Thermalia® twin H (13-22): 1½″ 4x 0.965 m
- 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

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 loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

Seal of approval FWS
The Thermalia® twin (20-42) and twin H (13-22) series are certified by the seal of approval of the authorisation commission of Switzerland.

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.

Options for TopTronic® E controller
- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting 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"

Electrical connections
- Connection to the rear

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

Option
- Internet connection

Part No.

Brine/water-water/water heat pump

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 brochure "Accessories" - chapter "Circulating pumps"

Energy efficiency class
see Description

Brine/water-water/water heat pump with 2 hermetic spiral (scroll) compressors for indoor installation with flexible connection pipes and built-in Hoval TopTronic® E control

Control functions integrated for
  - 1 heating circuit with mixer
  - 1 heating circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Can be optionally expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion universal
  - module expansion heat accounting
- Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Delivery
- Compact device internally wired ready for installation
- Heat pump on pallet, plastic hood and sound-insulating floor mat separately packed.
- Flexible hoses included
- Sensor set separately packed

Hoval Thermalia® twin

Refrigerant R410A
Flow temperature max. 62 °C

Thermalia® twin Type	Heat output B0W35 kW	Heat output W10W35 kW	Part No.
(20)	20.4	27.3	7014 725
(26)	26.2	35.1	7014 726
(36)	35.3	46.4	7014 727
(42)	42.0	55.4	7014 728

Hoval Thermalia® twin H

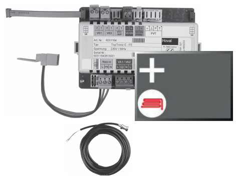
Refrigerant R134a
Flow temperature max. 67 °C

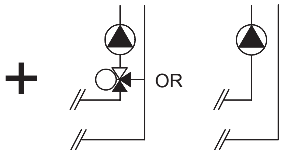
Thermalia® twin Type	Heat output B0W35 kW	Heat output W10W35 kW	Part No.
(13)	12.3	17.0	7014 729
(19)	18.0	24.7	7014 730
(22)	20.9	28.8	7014 731

Part No.

TopTronic® E module expansions

for TopTronic® E basic module heat generator





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

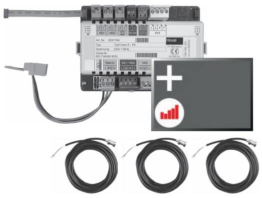
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

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

in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

6037 062

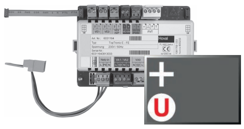
Notice
The flow rate sensor set must be ordered as well.

Flow rate sensor sets
Plastic housing

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



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

incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

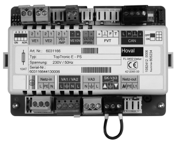
6034 575

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

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

Accessories for TopTronic® E

		Part No.
Supplementary plug set		
for basic module heat generator (TTE-WEZ)		6034 499
for controller modules and module expansion TTE-FE HK		6034 503



TopTronic® E controller modules		
TTE-HK/WW	TopTronic® E heating circuit/ hot water module	6034 571
TTE-SOL	TopTronic® E solar module	6037 058
TTE-PS	TopTronic® E buffer module	6037 057
TTE-MWA	TopTronic® E measuring module	6034 574

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

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	

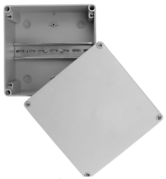
HovalConnect	
HovalConnect LAN	6049 496
HovalConnect WLAN	6049 498

HovalConnect available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules	
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing		6035 563
WG-190	Wall casing small	6035 564
WG-360	Wall casing medium	6035 565
WG-360 BM	Wall casing medium with control module cut-out	6035 566
WG-510	Wall casing large	6038 533
WG-510 BM	Wall casing large with control module cut-out	

TopTronic® E sensors		2055 889
AF/2P/K	Outdoor sensor	2055 888
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2056 775
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 776
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	



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

	2061 826
Bivalent switch	

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

2018 837

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

- Three-way ball valve made of brass with threaded connection
- incl. seals and screw connections

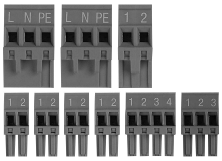
DN	Connection	kvs m^3/h	Part No.
25	Rp 1″	9	6052 444
32	Rp 1¼″	13	6052 445
40	Rp 1½″	25	6052 446
50	Rp 2″	37	6052 447

Suitable motor drive

Type	Voltage	Control signal	Actuator run time	Part No.
GLB341.9E	230 V / 50/60 Hz	2-/3-point	150 s	2070 331

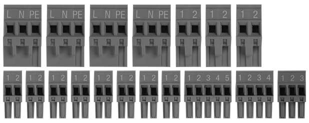
Screw-in electrical heating inset
for plants with technical storage tank
as emergency heating.

Type	Heat output [kW]	Installation depth [mm]	Part No.
EP 2.5	2.35	390	6049 557
EP 3.5	3.6	500	6049 558
EP 5	4.9	620	6049 559
EP 7.5	7.5	850	6049 560



Expansion connector set
for the automatic heat pump 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:
- 1x 230V digital input
- 2x 230V outputs
- 4x low-voltage inputs
- 1x ratio. Input

6032 509



Universal connector set
for automatic heat pump ECR461
Plugs:
- 3x 230V digital input
- 4x 230V outputs
- 6x low-voltage inputs
- 2x low-voltage outputs
- 1x ratio. input
- 1x electr. expansion valve

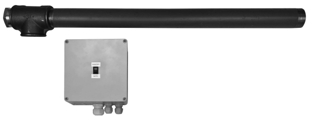
6032 510

Part No.

Necessary at boiler room temperatures < 10 °C

Crankcase heater
for Belaria® twin I, twin IR,
Thermalia® comfort, Thermalia® twin
for compressor protection
For Belaria® twin I, twin IR
2 pieces are necessary!

6019 718



Instantaneous water heater kit DN 50
from ready electrical box
for electrical protection incl.
assembly fittings.
for combination with all screw-in
heating inset EP.
Screw-in heaters must be
ordered separately.

6044 070

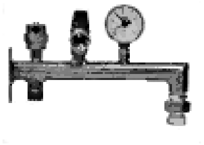
System water protection filter
FGM025...050 - 200
For horizontal installation in return for filtration of heating and cooling water, with high filtration capacity for corrosion particles and dirt without significant pressure loss.
Consisting of:
- Filter head and bowl in brass
- Magnetic insert (nickel-neodymium)
- 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

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	Volume flow [m^3/h] at Δp <0.1 bar pressure loss	Part No.
FGM025	Rp 1″	5.5	2076 374
FGM025	Rp 2″	7.2	2076 375
FF050	DN 50	18.0	2076 376

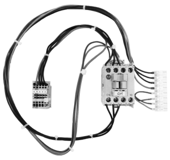
Further strainers
see “Various system components”

		Part No.
	**Safety group SG15-¾″** Retaining bar incl. safety valve, pressure gauge, air vent and connection fittings for expansion chambers	2015 354
	**Expansion chamber** Reflex NG 25 for systems up to approx. 20 kW Operating pressure: up to 6 bar Pre-pressure: 1.5 bar Ø 280 mm, H = 490 mm	242 791

Ground water accessories

Float ball flow switch
nominal pressure 10 bar
installed length 335 mm
bistable reed contact as
contact open, if there is no flow

Area of application l/h	°C	Connection	Part No.
1500-15000	0-80	Rp 2″	2040 709

		Part No.
	**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

		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 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 Max. operating pressure 1.0 MPa (10 bar) Dirt screen integrated	6033 364
	**Immersion sensor TF/2P/2.5/6T, L = 2.5 m** for TopTronic® E controller modules/ module expansions with exception of basic module district heating/fresh water or basic module district heating com, cable length: 2.5 m without plug sensor sleeve diameter: 6 x 50 mm, dewpoint-proof, sensor may already be included in scope of delivery of heat generator/controller module/module expansion, operating temperature: -20…105 °C, index of protection: IP67	2056 789
	**Freeze 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

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 and Thermalia® twin H (13-22) with R134a

Type		(20)	(26)	(36)	(42)	H (13)	H (19)	H (22)
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	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[1]	20.4	26.2	35.3	42.0	12.3	18.0	20.9
• Power consumption B0W35	kW[1]	4.2	5.5	7.1	8.8	2.7	4.1	4.6
• Performance B0W35	COP	4.89	4.79	4.96	4.76	4.48	4.42	4.58
• Heat output W10W35	kW[1]	27.3	35.1	46.4	55.4	17.0	24.7	28.8
• Power consumption W10W35	kW[1]	4.2	5.5	7.2	9.1	3.0	4.4	4.9
• Performance W10W35	COP	6.59	6.40	6.41	6.06	5.76	5.61	5.89
• Operating weight	approx. kg	280	286	298	310	273	283	293
• Compressor type		2 x spiral (scroll). hermetic						
• Refrigerant filling R410A	kg	6.5	7.1	8.2	9.0	-	-	-
Refrigerant filling R134a	kg	-	-	-	-	4.8	5.9	6.5
• Condenser/evaporator		Plate heat exchanger						
Material		Stainless steel V4A, AISI 316, 1.4401						
Connections	R	1½″	1½″	2″	2″	2″	2″	2″
Piping connections with flex. connecting hose	Rp	1½″	1½″	2″	2″	2″	2″	2″
Nominal volume flow and resistance brine/water heat pump								
• *Heating (Δt = 7K)*	m³/h	2.5	3.3	4.4	5.2	1.6	2.3	2.7
ΔP Pressure drop condenser	kPa	5.3	7.3	5.0	5.3	1.6	2.0	2.3
• *Heat source (Δt = 3.5K)*	m³/h	5.0	6.3	8.1	10.2	3.3	4.7	5.6
ΔP Pressure drop evaporator	kPa	12	13	14	14	4.0	5.0	6.0
Nominal volume flow and resistance water/water heat pump								
• *Heating (Δt = 7K)*	m³/h	3.4	4.3	5.7	6.8	2.2	3.2	3.8
ΔP Pressure drop condenser	kPa	9.8	12.5	8.5	9.0	3.1	3.9	4.4
• *Heat source (Δt = 5K)*[5]	m³/h	4.0	5.0	6.8	8.0	2.6	3.7	4.4
ΔP Pressure drop evaporator	kPa	5.0	5.5	6.5	6.0	2.4	3.0	3.6
• Operating pressure max.								
- Water side	bar	6						
- Brine side	bar	6						
• Operating limit values - *see diagram range of application*								
• Installation place operation[4] min./max.	°C	5/35						
Storage min./max.	°C	-15/50						
Electrical data[3]								
Voltage	V	3 x 400						
Frequency	Hz	50						
Voltage range	V	380-420						
• Operating pressure compressor Imax		13.1	16.9	24.0	29.3	9.4	13.3	15.8
• Starting current with starting current limiter[2]		25.4	32.7	44.5	55.1	21.7	27.1	37.4
• Principal current (external protection)		16	20	32	32	16	16	20
with brine systems	Type	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
• Principal current (external protection)		20	25	32	40	16	20	25
with ground water systems		C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K	C,D,K
• Control current (external protection)		13	13	13	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	B,C,D,K,Z	B,C,D,K,Z	B,C,D,K,Z

[1] kW = standard values according to EN 14511; values for B0W35 with 25 % ethylene glycol (Antifrogen N)

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

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

[4] <10 °C crankcase heater necessary

[5] 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® twin (20-42), twin H (13-22)

Sound emission

The effective sound pressure level[1] in the installation room is dependent on different factors like room size, absorptive capacity, reflection, free sound spreading 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.

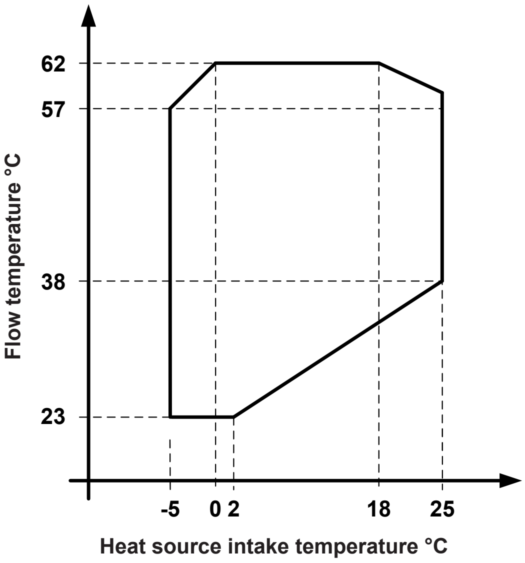
Thermalia® twin		(20)		(26)		(36)		(42)	
Thermalia® twin H		(13)		(19)		(22)			
Stage		1	2	1	2	1	2	1	2
Sound power level dB(A)	dB(A)	47	50	49	51	52	55	53	56
Sound pressure level dB(A)[1]	dB(A)	35	38	37	39	40	43	41	44

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

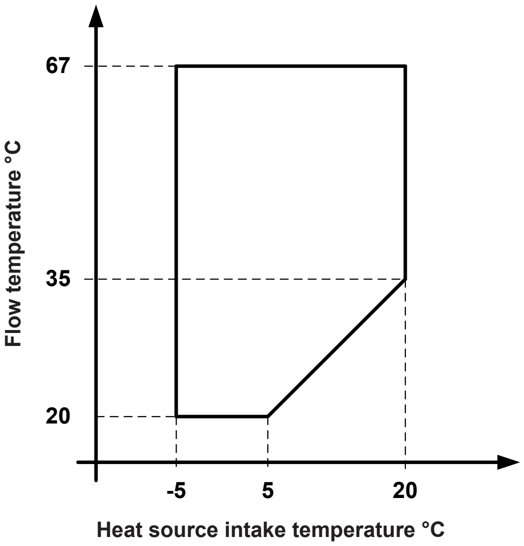
Diagrams range of application

Heating and hot water

Thermalia® twin (20-42)

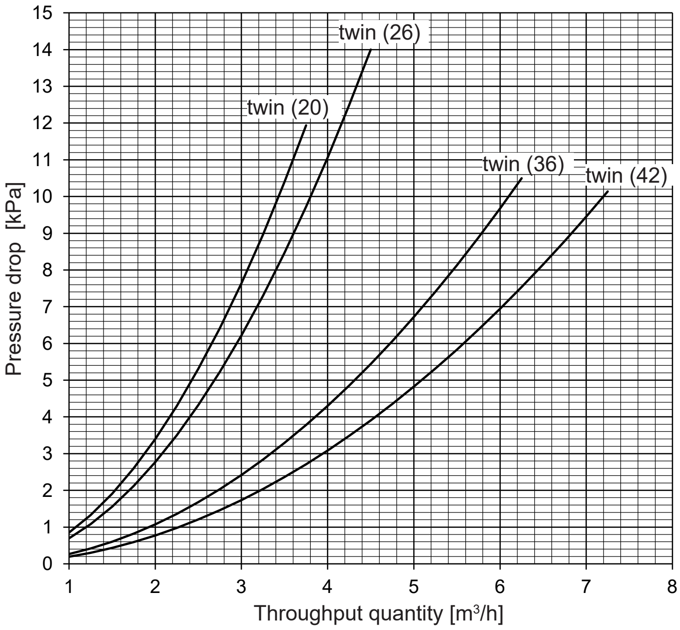


Thermalia® twin H (13-22)



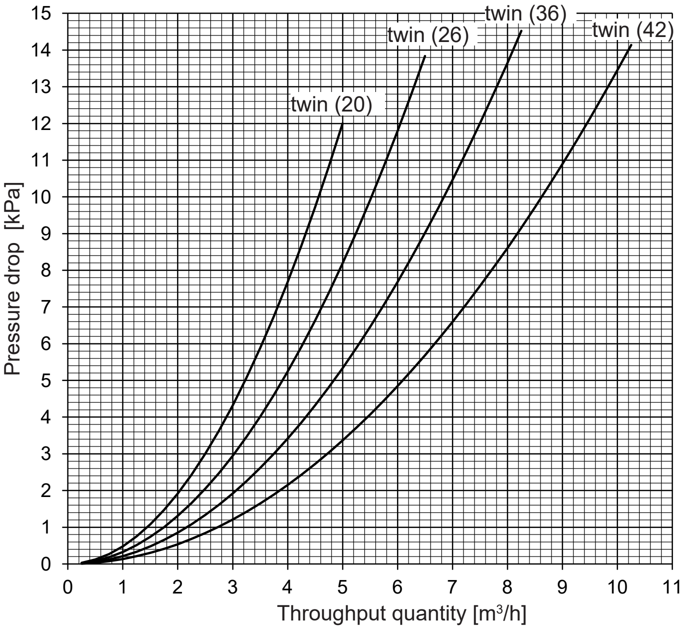
Thermalia® twin (20-42)
Heating

Pressure drop condenser with water



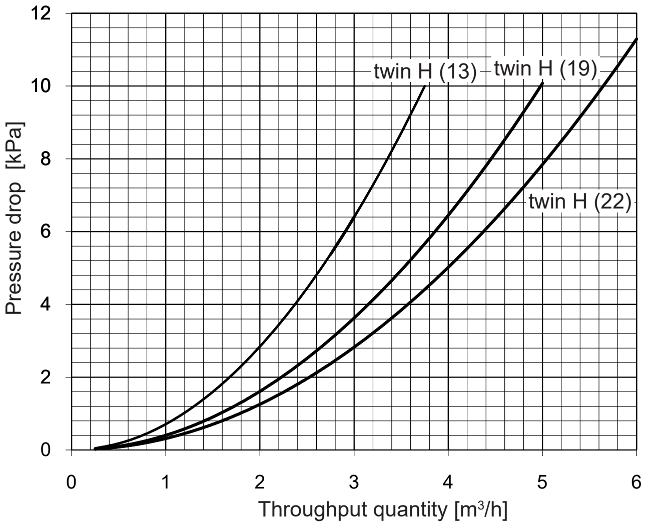
Heat source

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



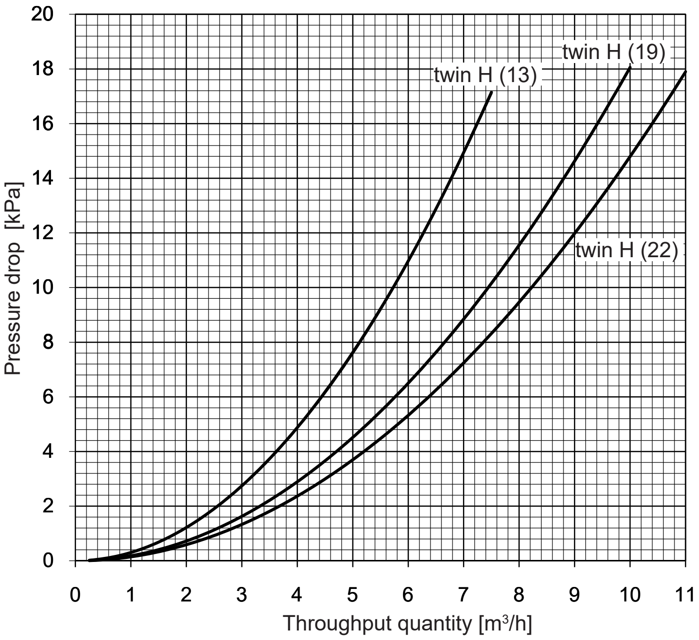
Thermalia® twin H (13-22)
Heating

Pressure drop condenser with water



Heat source

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



Refrigeration capacity

$$\boxed{Q_0 = Q - P}$$

Q_0 = Refrigeration capacity (kW)
Q = Heat output (kW)
P = Power consumption compressor (kW)
Δt_2 = Temperature difference heat source supply/discharge (K)
C = 0.86
c_p = 0.89 (specific heat)
γ = 1.05 (specific weight, density)

Volume flow evaporator

$$\boxed{V = \frac{Q_0 \cdot c}{\Delta t_2 \cdot c_p \cdot \gamma} \quad (\text{m}^3/\text{h})}$$

Δp (kPa) = Pressure drop with frost protection (1 kPa = 0.1 mWC)
Δp = f x ΔP

f		Ethylene glycol % (Antifrogen N)
0.97	≙	20 %
1	≙	25 %
1.03	≙	30 %

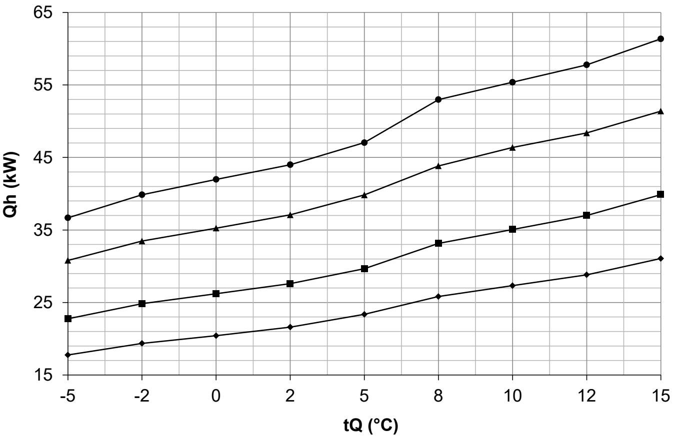
Δp_w (kPa) = Pressure drop with water (1 kPa = 0.1 mWC)
Δp_w = ΔP x 0.89

Performance data - heating

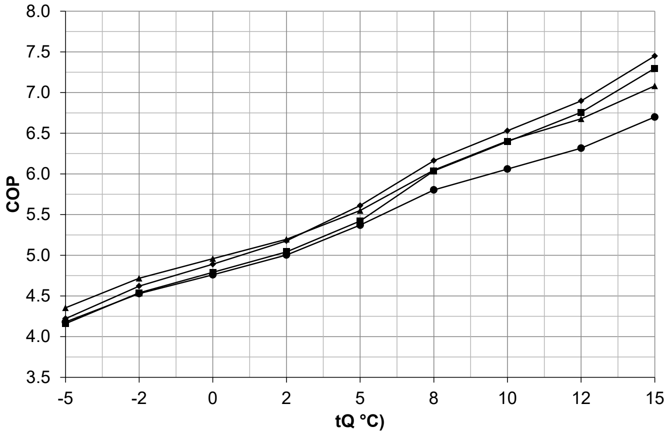
Maximum heat output

Thermalia® twin (20-42)

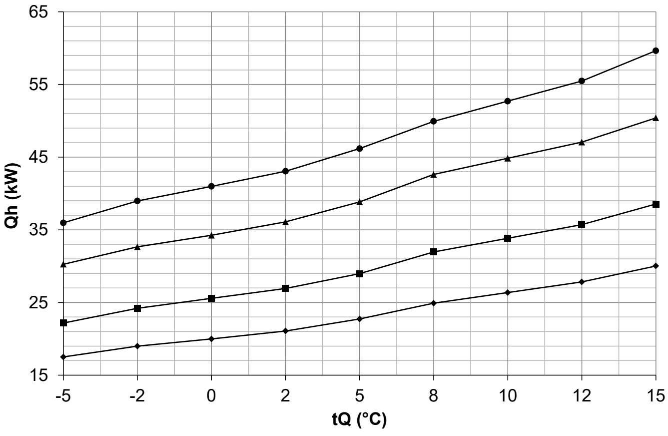
Heat output - t_{VL} 35 °C



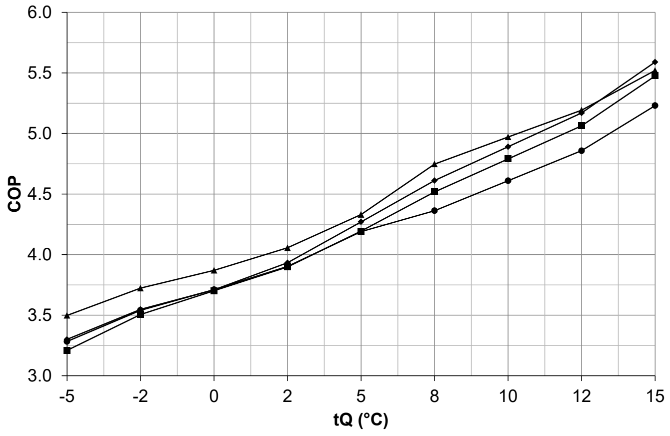
Output rating - t_{VL} 35 °C



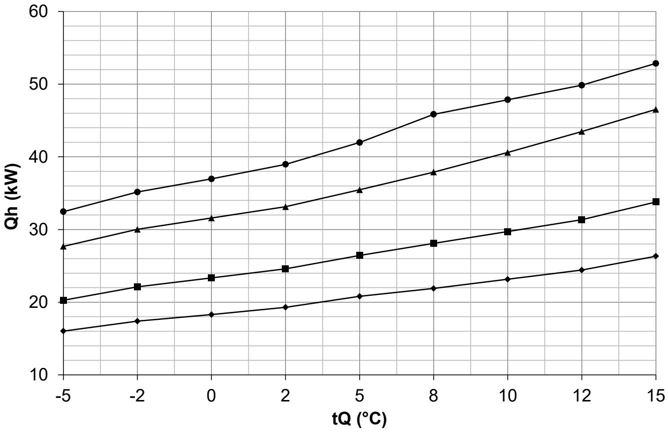
Heat output - t_{VL} 45 °C



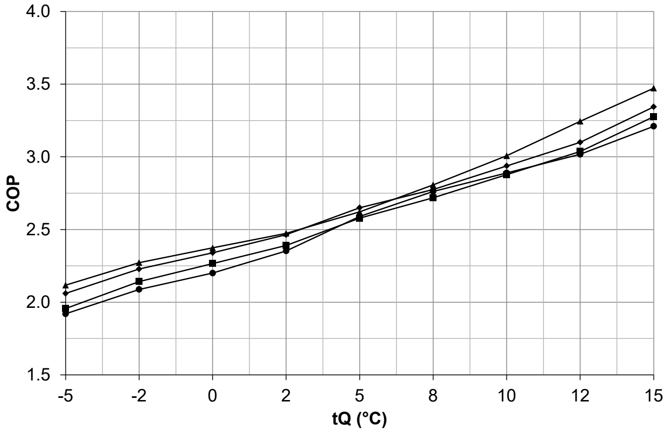
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 60 °C



Output rating - t_{VL} 60 °C



tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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 EN14511

Type				(20)			(26)			(36)			(42)	
tVL		tQ	Qh	P	COP	Qh	P	COP	Qh	P	COP	Qh	P	COP
°C		°C	kW	kW		kW	kW		kW	kW		kW	kW	
30	Brine	-5	18.1	3.7	4.85	23.3	4.9	4.77	31.4	6.3	4.96	36.8	7.9	4.68
		-2	19.8	3.7	5.32	25.4	4.9	5.22	34.2	6.3	5.42	40.3	7.9	5.11
		0	20.9	3.7	5.64	26.8	4.9	5.53	36.1	6.3	5.72	42.5	7.9	5.39
		2	22.0	3.7	5.97	28.2	4.8	5.84	38.0	6.3	6.03	44.8	7.9	5.68
		5	23.8	3.7	6.47	30.4	4.8	6.30	40.8	6.3	6.48	48.1	7.9	6.12
	Water	8	26.3	3.6	7.33	33.7	4.7	7.18	44.4	6.4	6.96	54.5	8.0	6.84
		10	27.8	3.6	7.76	35.7	4.7	7.61	47.2	6.4	7.43	56.7	8.0	7.10
		12	29.3	3.6	8.20	37.6	4.7	8.03	49.0	6.3	7.74	58.9	8.0	7.36
		15	31.6	3.6	8.85	40.5	4.7	8.67	51.9	6.3	8.21	62.2	8.0	7.74
35	Brine	-5	17.8	4.2	4.22	22.8	5.5	4.16	30.8	7.1	4.35	36.7	8.8	4.18
		-2	19.4	4.2	4.62	24.8	5.5	4.54	33.5	7.1	4.72	39.9	8.8	4.53
		0	20.4	4.2	4.89	26.2	5.5	4.79	35.3	7.1	4.96	42.0	8.8	4.76
		2	21.6	4.2	5.18	27.6	5.5	5.04	37.1	7.1	5.20	44.0	8.8	5.00
		5	23.4	4.2	5.61	29.7	5.5	5.42	39.8	7.2	5.55	47.0	8.8	5.37
	Water	8	25.8	4.2	6.16	33.1	5.5	6.04	43.8	7.3	6.05	53.0	9.1	5.80
		10	27.3	4.2	6.53	35.1	5.5	6.40	46.4	7.2	6.41	55.4	9.1	6.06
		12	28.8	4.2	6.90	37.0	5.5	6.76	48.4	7.2	6.68	57.8	9.1	6.32
		15	31.1	4.2	7.45	39.9	5.5	7.30	51.4	7.3	7.08	61.4	9.2	6.70
40	Brine	-5	17.6	4.8	3.71	22.5	6.2	3.63	30.5	7.9	3.88	36.3	9.9	3.68
		-2	19.2	4.8	4.02	24.5	6.2	3.96	33.1	7.9	4.17	39.4	9.9	3.98
		0	20.2	4.8	4.23	25.9	6.2	4.18	34.8	8.0	4.35	41.5	9.9	4.18
		2	21.3	4.8	4.48	27.3	6.2	4.40	36.6	8.0	4.56	43.5	9.9	4.39
		5	23.0	4.7	4.86	29.3	6.2	4.74	39.3	8.1	4.87	46.6	9.9	4.71
	Water	8	25.4	4.8	5.29	32.6	6.3	5.18	43.2	8.1	5.33	51.5	10.3	5.00
		10	26.8	4.8	5.61	34.5	6.3	5.49	45.6	8.1	5.61	54.0	10.3	5.25
		12	28.3	4.8	5.92	36.4	6.3	5.80	47.7	8.2	5.85	56.6	10.3	5.51
		15	30.5	4.8	6.40	39.2	6.3	6.27	50.9	8.2	6.21	60.5	10.3	5.88
45	Brine	-5	17.5	5.3	3.30	22.2	6.9	3.21	30.3	8.7	3.50	36.0	11.0	3.28
		-2	19.0	5.4	3.55	24.2	6.9	3.50	32.7	8.8	3.72	39.0	11.0	3.54
		0	20.0	5.4	3.71	25.6	6.9	3.70	34.3	8.9	3.87	41.0	11.0	3.71
		2	21.1	5.4	3.93	26.9	6.9	3.90	36.1	8.9	4.06	43.1	11.0	3.90
		5	22.7	5.3	4.27	29.0	6.9	4.19	38.9	9.0	4.33	46.2	11.0	4.19
	Water	8	24.9	5.4	4.61	32.0	7.1	4.52	42.6	9.0	4.75	49.9	11.4	4.36
		10	26.4	5.4	4.89	33.8	7.1	4.79	44.8	9.0	4.97	52.7	11.4	4.61
		12	27.8	5.4	5.17	35.7	7.1	5.06	47.1	9.1	5.19	55.5	11.4	4.86
		15	30.0	5.4	5.59	38.5	7.0	5.48	50.4	9.1	5.52	59.6	11.4	5.23
50	Brine	-5	17.0	6.0	2.84	21.8	7.8	2.78	29.6	9.6	3.07	34.5	12.5	2.75
		-2	18.4	6.0	3.06	23.6	7.8	3.03	32.1	9.7	3.30	37.4	12.6	2.97
		0	19.4	6.1	3.20	24.9	7.8	3.20	33.8	9.8	3.45	39.4	12.6	3.12
		2	20.4	6.1	3.38	26.1	7.7	3.37	35.2	9.8	3.60	41.6	12.6	3.31
		5	22.0	6.0	3.65	28.0	7.7	3.63	37.2	9.7	3.84	44.7	12.4	3.59
	Water	8	24.0	6.1	3.92	30.8	8.0	3.84	42.1	10.1	4.18	48.7	13.0	3.76
		10	25.4	6.1	4.15	32.6	8.0	4.07	44.2	10.1	4.36	51.3	12.9	3.96
		12	26.8	6.1	4.39	34.4	8.0	4.30	46.3	10.2	4.55	53.8	12.9	4.17
		15	28.9	6.1	4.74	37.1	8.0	4.64	49.5	10.3	4.83	57.6	12.9	4.47
55	Brine	-5	16.4	6.6	2.47	21.4	8.8	2.44	29.0	10.6	2.73	33.0	14.1	2.34
		-2	17.8	6.7	2.66	23.1	8.7	2.65	31.6	10.7	2.95	35.9	14.2	2.53
		0	18.8	6.7	2.79	24.2	8.6	2.80	33.3	10.8	3.10	37.9	14.2	2.66
		2	19.8	6.7	2.94	25.3	8.6	2.95	34.2	10.6	3.22	40.1	14.1	2.84
		5	21.3	6.7	3.16	26.9	8.5	3.18	35.6	10.4	3.41	43.3	13.9	3.12
	Water	8	23.1	6.9	3.37	29.7	9.0	3.30	41.5	11.2	3.72	47.5	14.5	3.28
		10	24.5	6.9	3.57	31.4	9.0	3.50	43.6	11.2	3.88	49.9	14.5	3.45
		12	25.8	6.9	3.77	33.2	9.0	3.69	45.6	11.3	4.04	52.2	14.4	3.62
		15	27.9	6.8	4.07	35.8	9.0	3.99	48.6	11.4	4.28	55.7	14.4	3.87
60	Brine	-5	16.0	7.8	2.06	20.3	10.4	1.96	27.7	13.1	2.12	32.5	16.9	1.92
		-2	17.4	7.8	2.23	22.1	10.3	2.14	30.0	13.2	2.27	35.2	16.8	2.09
		0	18.3	7.8	2.34	23.3	10.3	2.27	31.6	13.3	2.37	37.0	16.8	2.20
		2	19.3	7.8	2.46	24.6	10.3	2.39	33.1	13.4	2.47	39.0	16.6	2.35
		5	20.8	7.9	2.65	26.4	10.3	2.58	35.5	13.5	2.62	42.0	16.2	2.59
	Water	8	21.9	7.9	2.78	28.1	10.3	2.72	37.9	13.5	2.81	45.9	16.6	2.76
		10	23.2	7.9	2.94	29.7	10.3	2.88	40.6	13.5	3.01	47.9	16.6	2.89
		12	24.4	7.9	3.10	31.4	10.3	3.04	43.5	13.4	3.24	49.9	16.5	3.02
		15	26.3	7.9	3.34	33.8	10.3	3.28	46.5	13.4	3.47	52.9	16.5	3.21

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

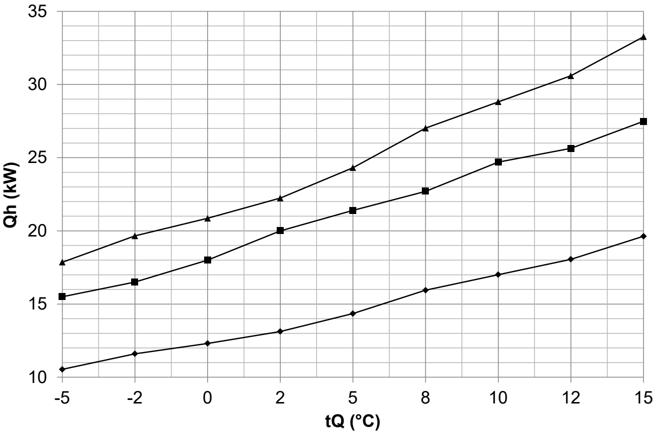
Observe daily power interruptions!
see "Engineering heat pumps general"

Performance data - heating

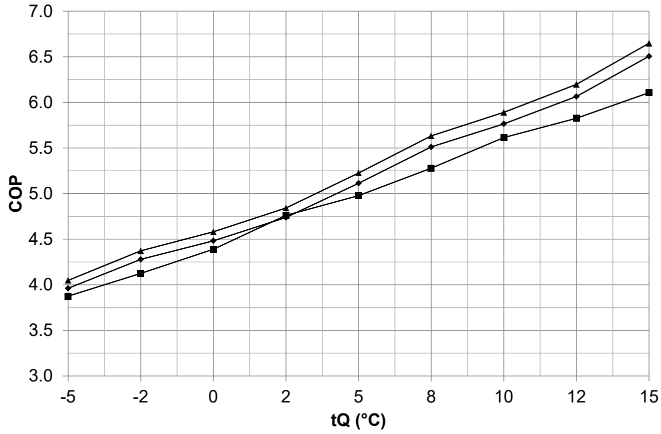
Maximum heat output

Thermalia® twin H (13-22)

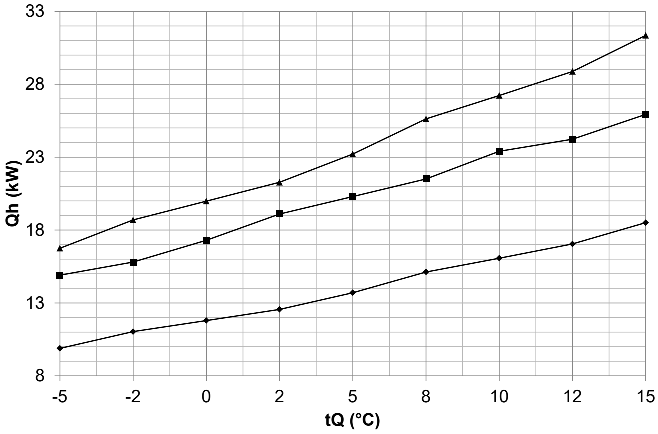
Heat output - t_{VL} 35 °C



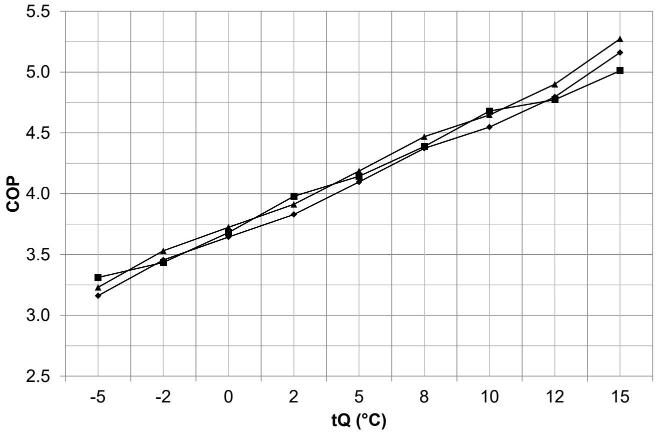
Output rating - t_{VL} 35 °C



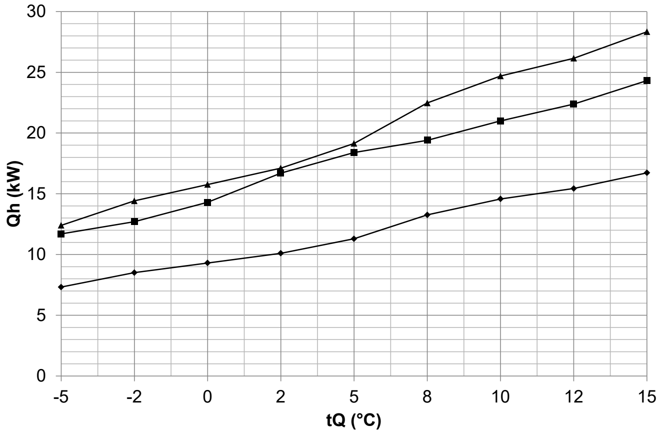
Heat output - t_{VL} 45 °C



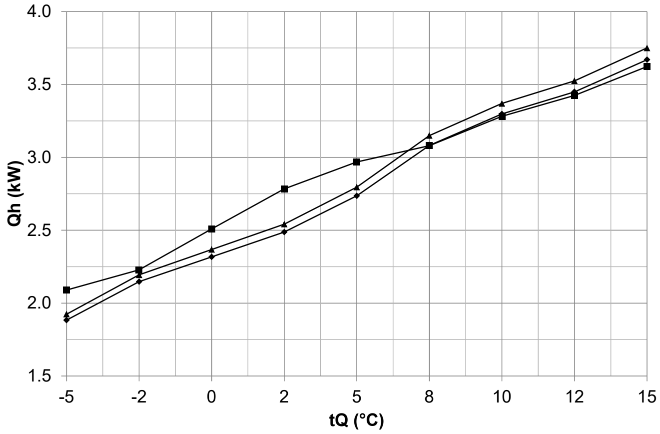
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 60 °C



Output rating - t_{VL} 60 °C



tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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 EN14511

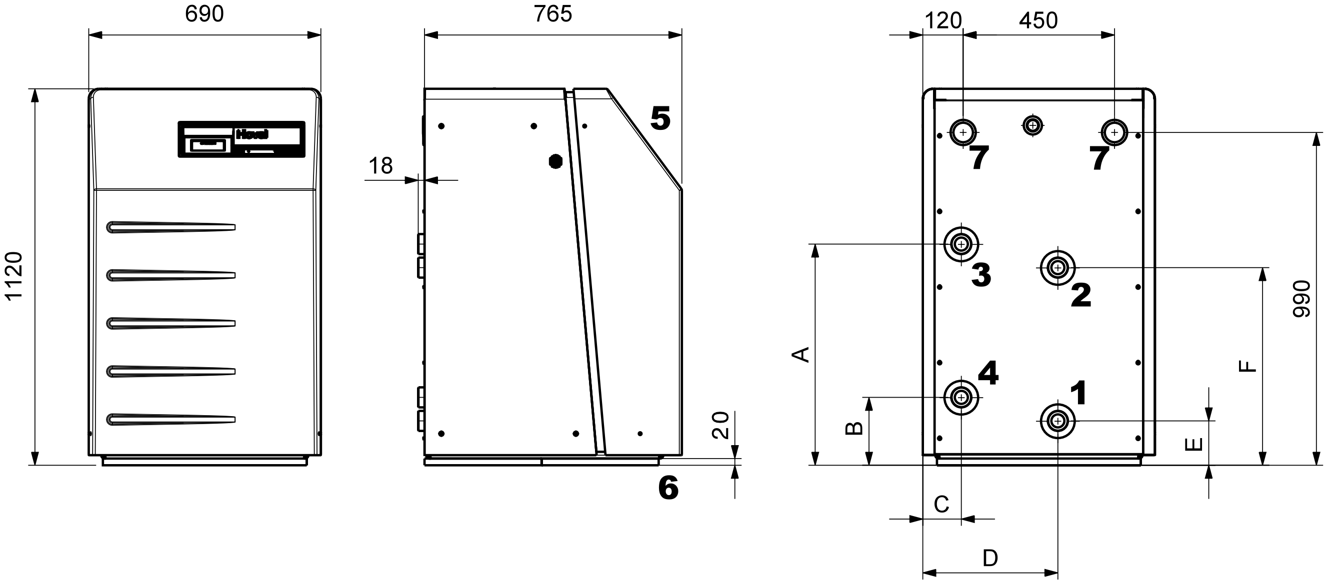
Type				H (13)			H (19)			H (22)	
tVL		tQ	Qh	P	COP	Qh	P	COP	Qh	P	COP
°C		°C	kW	kW		kW	kW		kW	kW	
30	Brine	-5	10.9	2.4	4.48	15.8	3.5	4.51	18.4	4.0	4.58
		-2	11.9	2.5	4.81	16.8	3.7	4.54	20.1	4.1	4.92
		0	12.6	2.5	5.03	18.4	3.7	4.97	21.3	4.1	5.14
		2	13.4	2.5	5.33	20.5	3.8	5.39	22.7	4.2	5.45
		5	14.7	2.5	5.78	22.0	3.9	5.64	24.9	4.2	5.91
	Water	8	16.4	2.6	6.27	24.0	4.0	5.96	27.7	4.3	6.40
		10	17.5	2.7	6.57	25.3	4.0	6.33	29.6	4.4	6.72
		12	-	-	-	-	-	-	-	-	-
		15	-	-	-	-	-	-	-	-	-
35	Brine	-5	10.5	2.7	3.96	15.5	4.0	3.87	17.9	4.4	4.05
		-2	11.6	2.7	4.28	16.5	4.0	4.09	19.7	4.5	4.37
		0	12.3	2.7	4.48	18.0	4.1	4.42	20.9	4.6	4.58
		2	13.1	2.8	4.74	20.0	4.2	4.76	22.2	4.6	4.84
		5	14.3	2.8	5.11	21.4	4.3	4.98	24.3	4.7	5.23
	Water	8	15.9	2.9	5.51	22.7	4.3	5.24	27.0	4.8	5.63
		10	17.0	3.0	5.76	24.7	4.4	5.61	28.8	4.9	5.89
		12	18.1	3.0	6.06	25.6	4.4	5.83	30.6	4.9	6.20
		15	19.6	3.0	6.51	27.5	4.5	6.11	33.3	5.0	6.65
40	Brine	-5	10.2	2.9	3.53	15.1	4.4	3.43	17.3	4.8	3.61
		-2	11.3	3.0	3.83	16.1	4.4	3.66	19.2	4.9	3.92
		0	12.1	3.0	4.03	17.6	4.5	3.91	20.4	5.0	4.12
		2	12.8	3.0	4.25	19.5	4.6	4.24	21.8	5.0	4.34
		5	14.0	3.1	4.56	20.8	4.7	4.43	23.8	5.1	4.66
	Water	8	15.5	3.2	4.89	22.0	4.8	4.58	26.3	5.3	5.00
		10	16.5	3.2	5.10	24.0	4.8	5.00	28.0	5.4	5.21
		12	17.5	3.3	5.37	25.1	4.9	5.13	29.7	5.4	5.49
		15	19.1	3.3	5.77	26.8	5.0	5.36	32.3	5.5	5.90
45	Brine	-5	9.9	3.1	3.16	14.9	4.5	3.31	16.8	5.2	3.23
		-2	11.0	3.2	3.45	15.8	4.6	3.43	18.7	5.3	3.53
		0	11.8	3.2	3.64	17.3	4.7	3.68	20.0	5.4	3.72
		2	12.6	3.3	3.83	19.1	4.8	3.98	21.3	5.4	3.91
		5	13.7	3.3	4.10	20.3	4.9	4.14	23.2	5.5	4.19
	Water	8	15.1	3.5	4.37	21.5	4.9	4.39	25.6	5.7	4.47
		10	16.1	3.5	4.55	23.4	5.0	4.68	27.2	5.9	4.65
		12	17.0	3.6	4.79	24.2	5.1	4.77	28.9	5.9	4.90
		15	18.5	3.6	5.16	25.9	5.2	5.01	31.4	5.9	5.27
50	Brine	-5	9.0	3.4	2.67	13.8	4.9	2.82	15.3	5.6	2.73
		-2	10.2	3.4	2.95	14.8	4.9	3.02	17.3	5.7	3.02
		0	11.0	3.5	3.14	16.3	5.0	3.26	18.6	5.8	3.20
		2	11.7	3.5	3.32	18.3	5.2	3.52	19.9	5.9	3.39
		5	12.9	3.6	3.58	19.7	5.3	3.72	21.9	6.0	3.66
	Water	8	14.5	3.7	3.88	20.8	5.4	3.85	24.6	6.2	3.96
		10	15.6	3.8	4.07	22.6	5.4	4.19	26.4	6.3	4.16
		12	16.5	3.9	4.27	23.6	5.5	4.27	28.0	6.4	4.37
		15	17.9	3.9	4.58	25.4	5.6	4.54	30.3	6.5	4.68
55	Brine	-5	8.2	3.6	2.25	12.8	5.2	2.46	13.9	6.0	2.30
		-2	9.3	3.7	2.52	13.8	5.3	2.60	15.8	6.1	2.58
		0	10.1	3.8	2.70	15.3	5.4	2.83	17.2	6.2	2.76
		2	10.9	3.8	2.87	17.5	5.6	3.13	18.5	6.3	2.94
		5	12.1	3.9	3.13	19.0	5.7	3.33	20.5	6.4	3.20
	Water	8	13.9	4.0	3.45	20.1	5.8	3.47	23.5	6.7	3.53
		10	15.1	4.1	3.65	21.8	5.9	3.69	25.5	6.8	3.73
		12	16.0	4.2	3.83	23.0	6.0	3.82	27.1	6.9	3.92
		15	17.3	4.2	4.09	24.8	6.2	4.03	29.3	7.0	4.18
60	Brine	-5	7.3	3.9	1.88	11.7	5.6	2.09	12.4	6.4	1.92
		-2	8.5	4.0	2.15	12.7	5.7	2.23	14.4	6.6	2.19
		0	9.3	4.0	2.32	14.3	5.7	2.51	15.8	6.7	2.37
		2	10.1	4.1	2.49	16.7	6.0	2.78	17.1	6.7	2.54
		5	11.3	4.1	2.74	18.4	6.2	2.97	19.1	6.8	2.80
	Water	8	13.3	4.3	3.08	19.4	6.3	3.08	22.5	7.1	3.15
		10	14.6	4.4	3.30	21.0	6.4	3.28	24.7	7.3	3.37
		12	15.4	4.5	3.45	22.4	6.5	3.42	26.2	7.4	3.52
		15	16.7	4.6	3.67	24.3	6.7	3.62	28.3	7.6	3.75

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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)



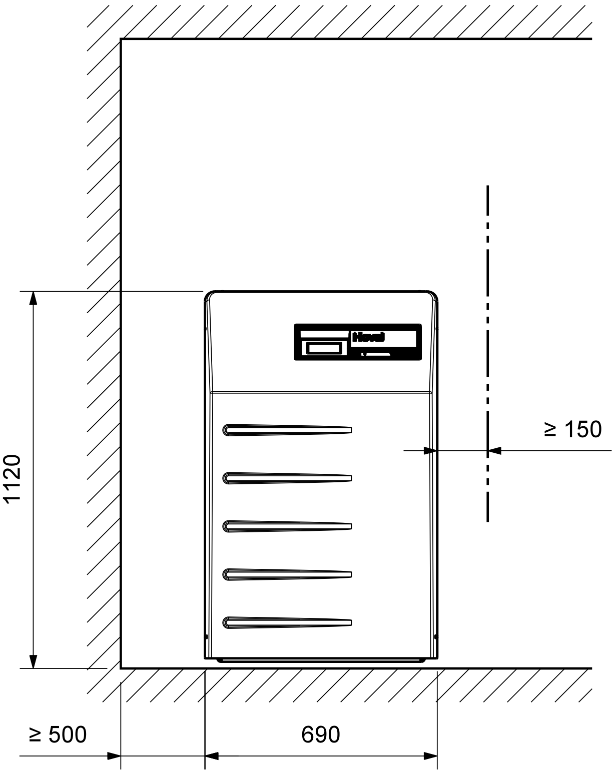
Type	A	B	C	D	E	F
Thermalia® twin (20-42)	741	222	274.5	481.5	170	689
Thermalia® twin H (13-22)	658	202	114	401	132	588

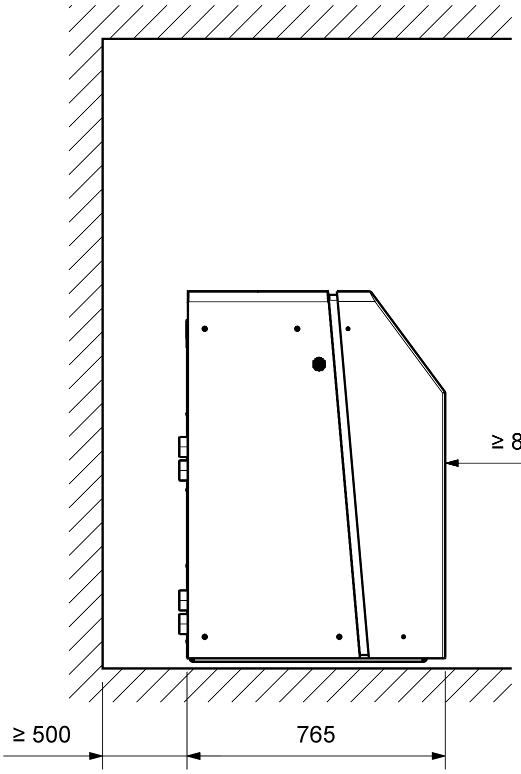
1 Heath source - discharge R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heat source - discharge R 2″
Thermalia® twin (36,42), twin H (22)
2 Heat source - inlet R 1½″
Thermalia® twin (20,26), twin H (13,19)
Heat source - inlet R 2″
Thermalia® twin (36,42), twin H (22)
3 Heating flow R 1½″
Thermalia® twin (20,26)
Heating flow R 2″
Thermalia® twin (36,42)
4 Heating return R 1½″
Thermalia® twin (20,26)
Heating return R 2″
Thermalia® twin (36,42)
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

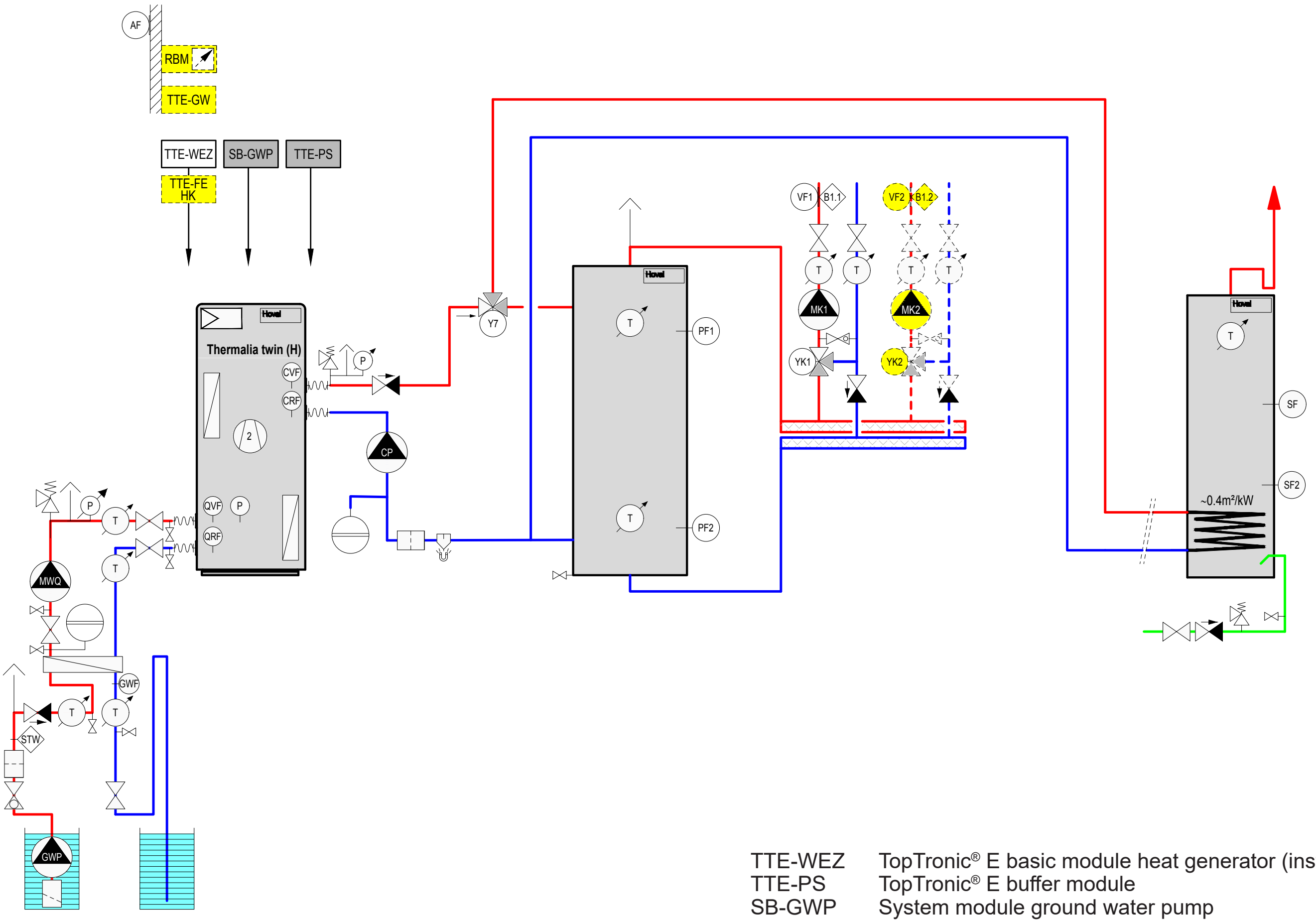




Thermalia® twin

Brine/water-water/water heat pump with
- water/water - indirect utilisation
- energy storage buffer tank
- calorifier
- 1-... mixer circuit(s)

Hydraulic schematic BBBCE070



TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-PS	TopTronic® E buffer module
SB-GWP	System module ground water pump
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
PF1	Buffer sensor 1
PF2	Buffer sensor 2
Y7	Switching valve
GWF	Frost controller
STW	Flow controller
CP	Condenser pump
GWP	Ground water pump
MWQ	Delivery pump in heat source intermediate circuit (cold-water design)

Option

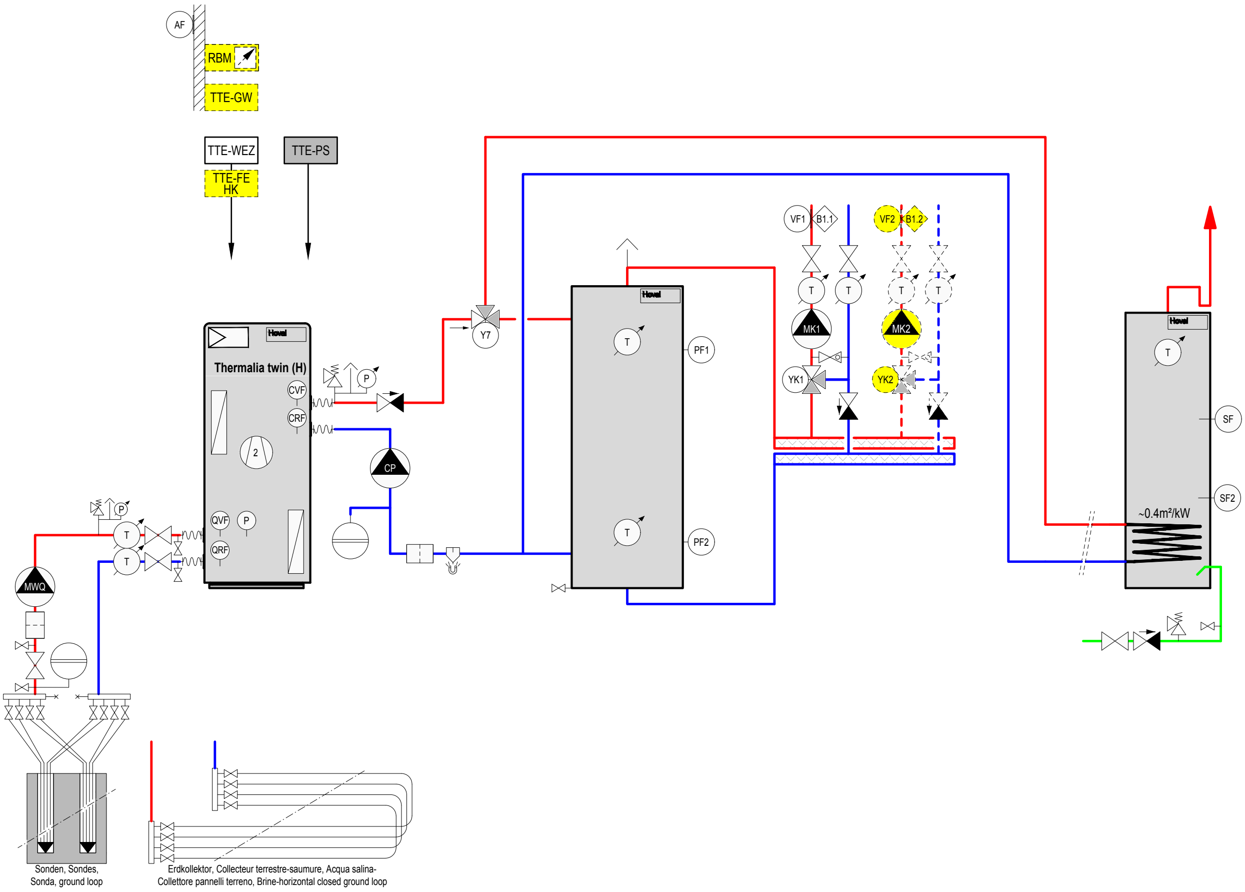
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

Thermalia® twin

Brine/water-water/water heat pump with
- earth probes
- energy storage buffer tank
- calorifier
- 1-... mixer circuit(s)

Hydraulic schematic BBBCE030



TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-PS	TopTronic® E buffer module
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
PF1	Buffer sensor 1
PF2	Buffer sensor 2
Y7	Switching valve
CP	Condenser pump
MWQ	Delivery pump in heat source intermediate circuit (cold-water design)

Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

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 refrigerant 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
- Hydraulic connections with flexible hoses and flanges
  Thermalia® dual, dual R (55-85): 2″ 4x 1 m
  Thermalia® dual, dual R (110,140): flange DN80/PN6
  Thermalia® dual H (35-70): 2″ 4x 1 m
  Thermalia® dual H (90): flange DN80/PN6
- Working media
  Thermalia® dual, dual R (55-140) with R410A
  Thermalia® dual H (35-90) with R134a
- Heat pump wired and ready to connect
- Operating side on front with integrated TopTronic® E controller

Seal of approval FWS
The Thermalia® dual (55-140), dual H (35-90) series are certified by the seal of approval of the authorisation commission of Switzerland.

Model range

Thermalia® dual Type	Water/ water 35 °C	55 °C	Brine/ water 35 °C	55 °C	Refrigerant	Flow min. °C	max. °C	Heat output B0W35 kW	W10W35 kW	Cooling capacity B17W9 kW	B25W18 kW
(55)	A+++	A+++	A+++	A++	2 x R410A	-	62	57.9	76.7	-	-
(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 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 loading 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 accounting
- 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”

Electrical connections

- Connection at rear

Delivery

- Heat pump pre-assembled and packed

Part No.

Brine/water or water/water heat pump

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 brochure “Accessories” - chapter “Circulating pumps”

Energy efficiency class
see Description

Brine/water-water/water heat pump with 2 hermetic spiral (scroll) compressors for indoor installation with built-in Hoval TopTronic® E control

Integrated control functions for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Can be optionally expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion universal or
  - module expansion heat balancing
- Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Delivery
Compact unit wired-up internally ready for connection, supplied fully packaged incl. connection hoses 2″ or weld-on flanges DN80/PN6

Hoval Thermalia® dual

Working medium R410A, 2 circuits.
Max. flow temperature 62 °C

Thermalia®	Heat output		
dual	for B0W35	for W10W35	
type	kW	kW	
(55)	57.9	76.7	7014 291
(70)	73.2	97.2	7014 292
(85)	84.8	112.8	7014 293
(110)	113.4	149.1	7014 294
(140)	137.8	181.1	7014 295

Hoval Thermalia® dual H

Working medium R134a, 2 circuits.
Max. flow temperature 70 °C

Thermalia®	Heat output		
dual H	for B0W35	for W10W35	
type	kW	kW	
H (35)	34.9	49.3	7014 296
H (50)	52.5	71.8	7014 297
H (70)	70.9	97.1	7014 298
H (90)	87.3	119.5	7014 299

Hoval Thermalia® dual R

Working medium R410A, 2 circuits.
Max. flow temperature 62 °C

Thermalia®	Cooling capacity 1)		
dual R	for B17W9	for B25W18	
type	kW	kW	
R (55)	64.7	81.1	7016 550
R (70)	86.2	108.3	7016 551
R (85)	107.0	127.7	7016 552
R (110)	138.1	165.0	7016 553
R (140)	156.9	183.9	7016 554

1) Heat output: see Hoval Thermalia® dual

Part No.

Accessories

Set of sound attenuation feet 65/75
for Thermalia® dual (55, 70), 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

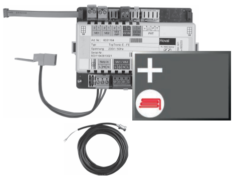
6045 228

Set of sound attenuation feet 45/55,
for Thermalia® dual (85, 110, 140),
H (70, 90), dual R (85, 110, 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

Part No.

TopTronic® E module expansions
for TopTronic® E basic module heat generator



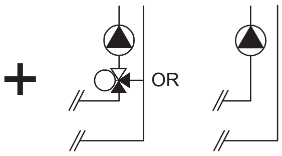
TopTronic® E module expansion heating circuit TTE-FE HK

6034 576

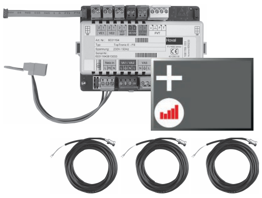
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel



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

6037 062

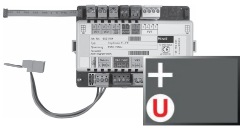
Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:
- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

in each case incl. energy balancing

incl. fitting accessories
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:
Boiler control, wall housing, control panel

Notice
Suitable flow rate sensors (pulse sensors) must be provided on site.



TopTronic® E module expansion Universal TTE-FE UNI

6034 575

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

incl. fitting accessories

Can be installed in:
Boiler control, wall housing, control panel

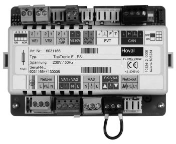
Further information
see “Controls” - “Hoval TopTronic® E module expansions” chapter

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

Accessories for TopTronic® E

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 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

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 available from mid-2020
Up to that point, TopTronic® E online is delivered.

TopTronic® E interface modules

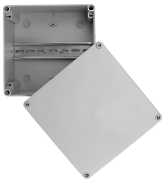
	Part No.
GLT module 0-10 V	6034 578
HovalConnect Modbus	6049 501
HovalConnect KNX	6049 593

TopTronic® E wall casing

		Part No.
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533

TopTronic® E sensors

		Part No.
AF/2P/K	Outdoor sensor	2055 889
TF/2P/5/6T	Immersion sensor, L = 5.0 m	2055 888
ALF/2P/4/T	Contact sensor, L = 4.0 m	2056 775
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776



System housing

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

	Part No.
Bivalent switch	2061 826

Outdoor sensor, immersion sensor and contact sensor supplied with the heat pump.

Further information
see “Controls”

Part No.

Accessories

Protective pipe immersion sleeve
SB 280 ½″
brass nickel-plated
PN10, 280 mm

2018 837

Flange compensator set DN80 PN6
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
DN80 PN6 without fittings
Structural length 130 mm

6040 025

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 loss.
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 Rp1″ andRp2″: Internal thread with integrated shut-off valves and union connection (outlet)
- Water temperature: max. 90 °C

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	Volume flow [m³/h] at Δp <0.1 bar pressure loss	
FGM025	Rp 2″	7.2	2076 375
FF050	DN 50	18.0	2076 376

Strainers
see “Various system components”

Immersion sensor TF/2P/2.5/6T,
L = 2.5 m
for TopTronic® E controller modules/
module expansions with exception of
basic module district heating/fresh
water or basic module district heating
com, cable length: 2.5 m without plug
sensor sleeve diameter: 6 x 50 mm,
dewpoint-proof,
sensor may already be included in scope
of delivery of heat generator/controller
module/module expansion, operating
temperature: -20…105 °C, index of
protection: IP67

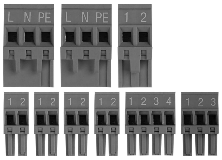
2056 789

Part No.

Float ball flow switch
nominal pressure 10 bar
installed length 335 mm
bistable reed contact as normally open contact
Contact open, if there is no flow

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

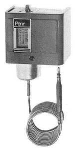
For active cooling, the installation of a flow controller is mandatory!



Expansion connector set

6032 509

for the automatic heat pump 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:
- 1x 230V digital input
- 2x 230V outputs
- 4x low-voltage inputs
- 1x ratio. Input



Frost protection temperature switch 270XT-95068

2007 313

to heat source ground water
Type of protection: IP 40
Area of application: -24/18 °C

Freeze protection concentrate PowerCool DC 924-PXL

2009 987

on basis propylene glycol
completely mixable with water
with corrosion protection
Frost protection: -20 °C with
40 % mixture ratio
Content plastic container: 10 kg

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)
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	57.9	73.2	84.8	113.4	137.8
• Power consumption B0W35	kW	12.5	15.9	18.3	27.9	29.9
• Performance B0W35	COP	4.63	4.60	4.63	4.62	4.61
• Heat output W10W35	kW	76.9	97.2	112.8	149.1	181.1
• Power consumption W10W35	kW	12.7	16.6	19.1	26.0	31.3
• Performance W10W35	COP	6.07	5.87	5.91	5.73	5.79
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						
• Maximum flow temperature	°C	62	62	62	62	62
• Operating pressure	bar	6	6	6	6	6
B0W35						
• 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″	DN80/PN6	DN80/PN6
B0W35						
• 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″	DN80/PN6	DN80/PN6
Hydraulic data water/water						
• Maximum flow temperature	°C	62	62	62	62	62
• Operating pressure	bar	6	6	6	6	6
W10/W35 (intermediate circuit)						
• 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″	DN80/PN6	DN80/PN6
W10/W35 (intermediate circuit)						
• Brine spread in intermediate circuit [1]	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″	DN80/PN6	DN80/PN6
Refrigerating data						
• Refrigerant		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	kg	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)						
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] 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)
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	34.9	52.5	70.9	87.3
• Power consumption B0W35	kW	8.1	12.0	16.3	20.3
• Performance B0W35	COP	4.31	4.38	4.35	4.30
• Heat output W10W35	kW	49.3	71.8	97.1	119.5
• Power consumption W10W35	kW	8.2	12.3	16.8	21.1
• Performance W10W35	COP	6.01	5.83	5.78	5.66
Sound data according to EN 12102					
• Sound power level	dB(A)	55.2	60.2	63.2	63.2
Hydraulic data brine/water					
• Maximum flow temperature	°C	70	70	70	70
• Operating pressure	bar	6	6	6	6
B0W35					
• 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″	DN80/PN6
B0W35					
• Brine spread	K	3	3	4	4
• Required volume flow	m^3/h	8.7	13.2	13.4	16.4
• Pressure drop, evaporator	kPa	8.9	9.1	8.3	8.8
• Evaporator connections	R ext. thread	2″	2″	2″	DN80/PN6
Hydraulic data water/water					
• Maximum flow temperature	°C	70	70	70	70
• Operating pressure	bar	6	6	6	6
W10/W35 (intermediate circuit)					
• 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″	DN80/PN6
W10/W35 (intermediate circuit)					
• Brine spread in intermediate circuit [1]	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″	DN80/PN6
Refrigerating data					
• Refrigerant		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 (Type of compressor oil: EMKARATE® RL 32HB - 160SZ - 160Z)	kg	2 x 3.3	2 x 6.2	2 x 8.0	2 x 8.0
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	491	700	770	800

[1] ∆T 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

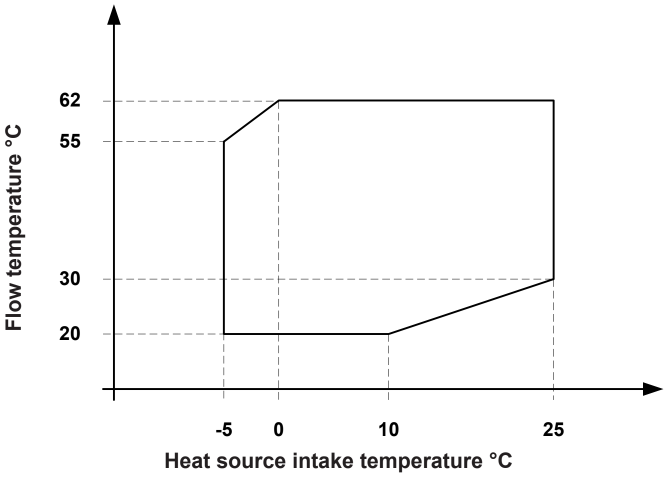
Type		R (55)	R (70)	R (85)	R (110)	R (140)
Seasonal coefficient of performance moderate climate (brine) 35 °C /55 °C	SCOP	5.1/3.7	5.0/3.7	5.1/3.7	5.1/3.7	5.0/3.7
Max. performance data heating and cooling in acc. with EN 14511						
• Heat output B0W35	kW	57.9	73.2	84.8	113.4	137.8
• Power consumption B0W35	kW	12.5	15.9	18.3	27.9	29.9
• Performance B0W35	COP	4.63	4.60	4.63	4.62	4.61
• Heat output W10W35	kW	76.9	97.2	112.8	149.1	181.1
• Power consumption W10W35	kW	12.7	16.6	19.1	26.0	31.3
• Performance W10W35	COP	6.07	5.87	5.91	5.73	5.79
• Cooling capacity B17W9	kW	64.7	86.2	107.0	138.1	156.9
• Power consumption B17W9	kW	10.6	13.1	14.8	21.2	25.9
• Performance B17W9	EER	6.12	6.6	7.21	6.51	6.05
• Cooling capacity B25W18	kW	81.1	108.3	127.7	165.0	183.9
• Power consumption B25W18	kW	12.6	16.2	18.4	26.2	30.4
• Performance 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						
• Maximum flow temperature	°C	62	62	62	62	62
• Operating pressure	bar	6	6	6	6	6
B0W35						
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m³/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 AG	2″	2“	2″	DN80/PN6	DN80/PN6
B0W35						
• Brine spread	K	3	4	4	4	5
• Required volume flow	m³/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 AG	2″	2″	2″	DN80/PN6	DN80/PN6
Hydraulic data water/water						
• Maximum flow temperature	°C	62	62	62	62	62
• Operating pressure	bar	6	6	6	6	6
W10/W35 (intermediate circuit)						
• Heating water spread	K	5	5	5	5	5
• Required volume flow	m³/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 AG	2″	2″	2″	DN80/PN6	DN80/PN6
W10/W35 (intermediate circuit)						
• Brine spread in intermediate circuit [1]	K	3	4	4	4	5
• Required volume flow GW	m³/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 AG	2″	2″	2″	DN80/PN6	DN80/PN6
Refrigerating data						
• Refrigerant		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	dm³	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 (55), EMKARATE® RL 32HB - 160SZ - 160Z)						
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)	m³	27.2	33.6	37.3	45.5	48.6
• Weight	kg	560	620	700	770	820

[1] 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.

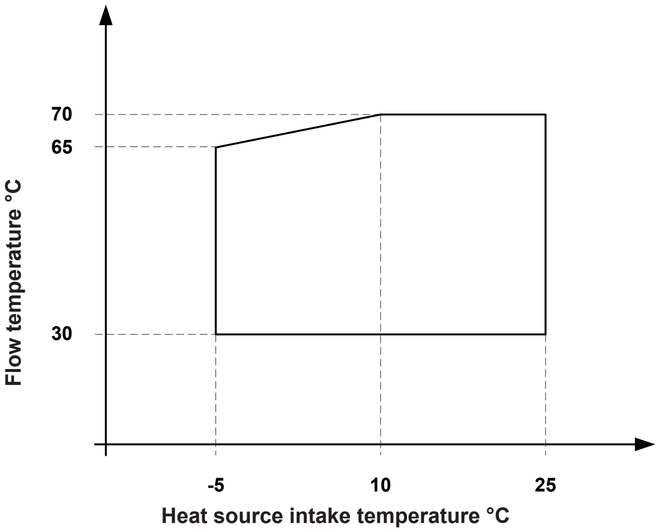
Diagrams range of application

Heating and hot water

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

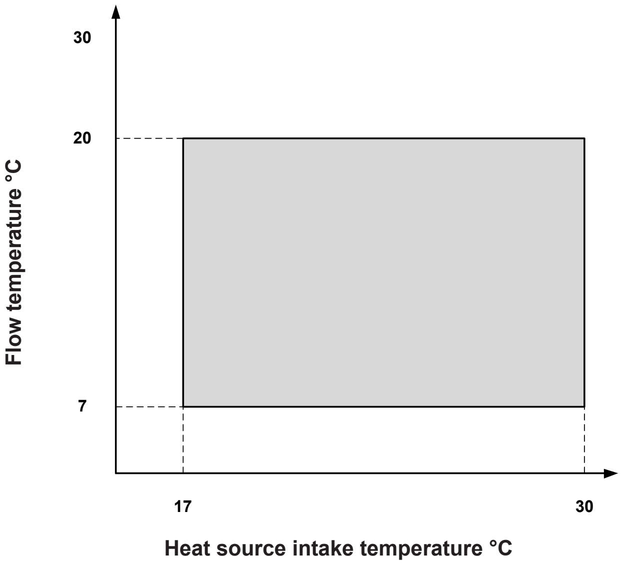


Thermalia® dual H (35-90)



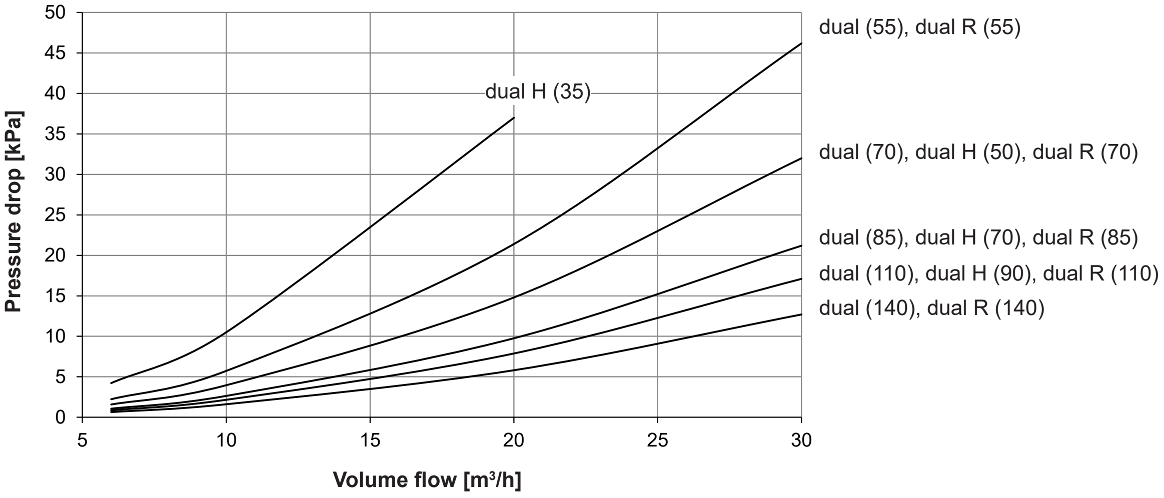
Cooling

Thermalia® dual R (55-140)



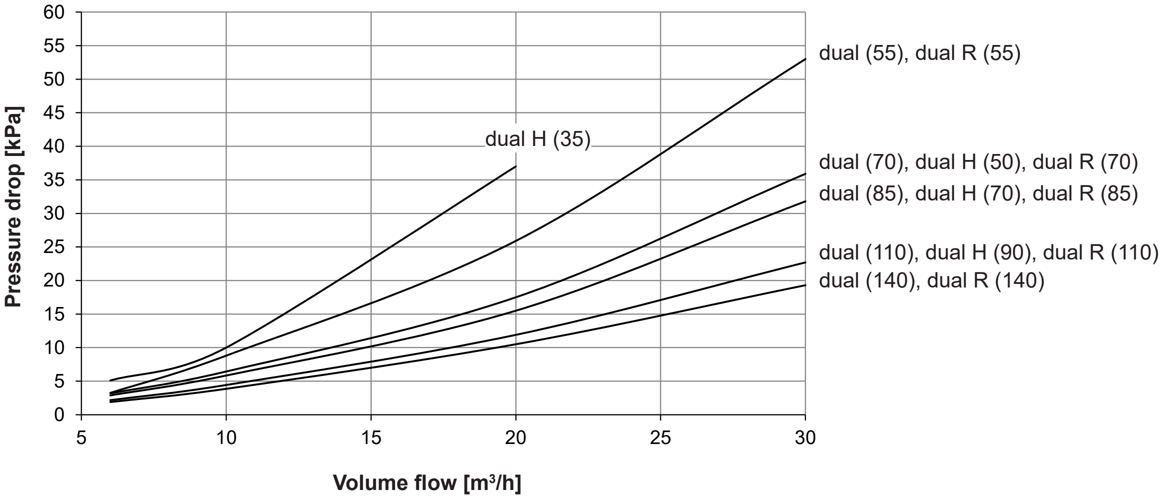
Heating

Pressure drop condenser
with water



Heat source

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



Cooling capacity

$$\boxed{Q_0 = Q - P}$$

Q_0 = cooling capacity (kW)
Q = heat output (kW)
P = power consumption compressor (kW)
Δt_2 = temperature difference heat source supply/discharge(K)
C = 0.86
c_p = 0.89 (specific heat)
γ = 1.05 (specific weight, density)

Volume flow evaporator

$$\boxed{V = \frac{Q_0 \cdot c}{\Delta t_2 \cdot c_p \cdot \gamma} \text{ (m}^3\text{/h)}}$$

Δp (kPa) = pressure drop with frost protection (1 kPa = 0.1 mWC)
Δp = f x ΔP

f		Ethylene glycol % (Antifrogen N)
0.97	≙	20 %
1	≙	25 %
1.03	≙	30 %

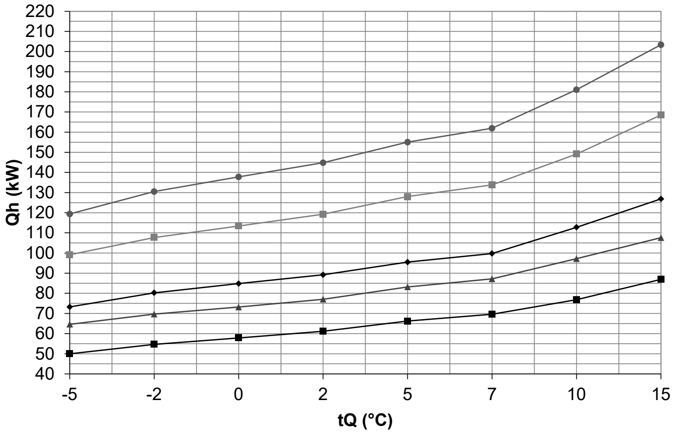
Δp_w (kPa) = Pressure drop with water (1 kPa = 0.1 mWC)
Δp_w = ΔP x 0.89

Performance data - heating

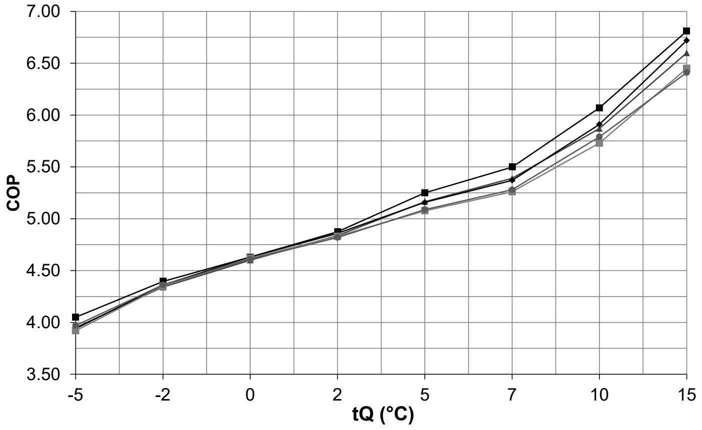
Maximum heat output

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

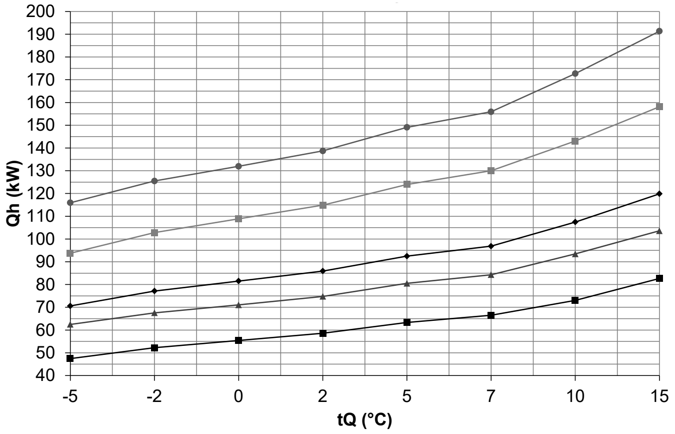
Heat output - t_{VL} 35 °C



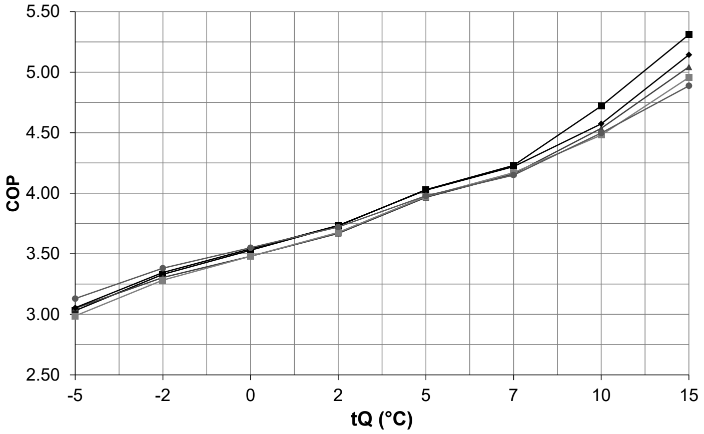
Output rating - t_{VL} 35 °C



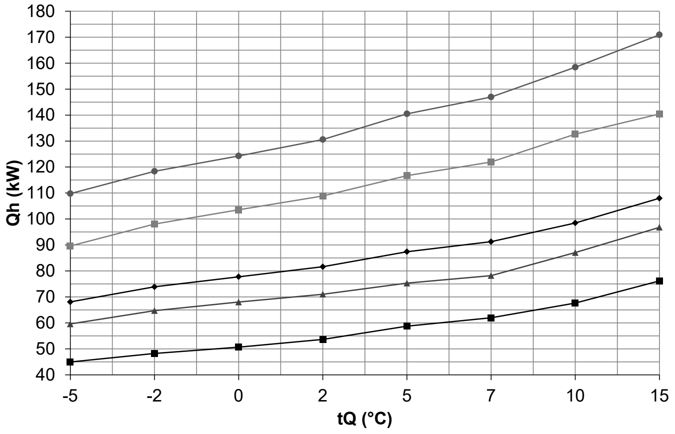
Heat output - t_{VL} 45 °C



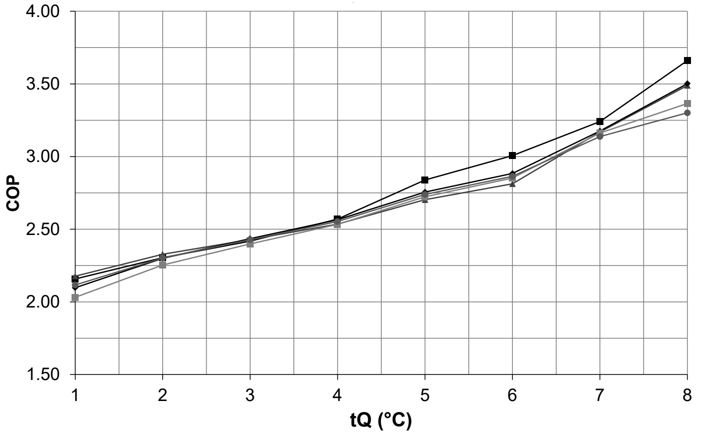
Output rating - t_{VL} 45 °C



Heat output - t_{VL} 62 °C



Output rating - t_{VL} 62 °C



■ 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)

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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® 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)		
tVL		tQ	Qh	P	COP	Qh	P	COP	Qh	P	COP	Qh	P	COP	Qh	P	COP
°C		°C	kW	kW		kW	kW		kW	kW		kW	kW		kW	kW	
30	Brine	-5	50.6	10.9	4.67	65.6	14.3	4.59	74.0	15.6	4.74	100.1	21.2	4.71	121.5	25.4	4.79
		-2	55.9	10.9	5.12	70.6	13.8	5.12	81.2	15.5	5.24	109.0	20.9	5.22	132.6	25.3	5.24
		0	59.3	11.0	5.41	74.1	13.6	5.47	86.0	15.5	5.56	115.0	20.8	5.54	139.9	25.4	5.52
		2	62.6	11.0	5.68	78.2	13.5	5.77	90.5	15.5	5.83	121.1	20.9	5.79	147.0	25.5	5.75
		5	67.6	11.2	6.05	84.9	13.7	6.18	97.1	15.7	6.19	130.3	21.5	6.07	157.5	26.0	6.06
		7	70.9	11.2	6.31	89.2	13.8	6.46	101.5	15.8	6.44	136.5	21.7	6.28	164.5	26.2	6.27
	Water	10	78.4	11.0	7.10	99.1	14.5	6.82	115.4	16.9	6.84	152.2	23.1	6.59	185.3	27.7	6.69
		15	88.8	11.2	7.93	109.6	14.2	7.73	130.3	16.7	7.82	173.7	23.2	7.48	209.4	28.0	7.47
35	Brine	-5	50.0	12.3	4.05	64.6	16.4	3.95	73.2	18.6	3.94	99.1	25.3	3.92	119.4	30.1	3.97
		-2	54.7	12.4	4.40	69.7	16.1	4.34	80.2	18.4	4.36	107.7	24.8	4.35	130.5	29.9	4.36
		0	57.9	12.5	4.63	73.2	15.9	4.60	84.8	18.3	4.63	113.4	24.6	4.62	137.8	29.9	4.61
		2	61.2	12.6	4.87	77.0	15.9	4.84	89.2	18.4	4.86	119.2	24.7	4.83	144.8	30.0	4.82
		5	66.3	12.6	5.25	83.2	16.1	5.16	95.5	18.5	5.16	128.0	25.2	5.08	155.0	30.5	5.09
		7	69.6	12.7	5.50	87.2	16.2	5.39	99.8	18.6	5.37	133.9	25.4	5.26	161.9	30.7	5.28
	Water	10	76.9	12.7	6.07	97.2	16.6	5.87	112.8	19.1	5.91	149.1	26.0	5.73	181.1	31.3	5.79
		15	86.9	12.8	6.81	107.6	16.3	6.60	126.8	18.9	6.72	168.5	26.1	6.45	203.4	31.7	6.41
40	Brine	-5	48.9	14.0	3.50	63.7	18.4	3.47	72.2	20.9	3.45	96.8	28.4	3.41	117.8	33.6	3.50
		-2	53.5	14.0	3.81	68.8	18.2	3.78	78.9	20.7	3.81	105.6	28.0	3.78	128.1	33.5	3.83
		0	56.6	14.1	4.02	72.2	18.1	4.00	83.4	20.6	4.05	111.4	27.8	4.01	135.0	33.4	4.04
		2	59.8	14.1	4.24	76.0	18.1	4.20	87.7	20.6	4.26	117.3	27.8	4.22	141.9	33.6	4.23
		5	64.8	14.1	4.58	81.9	18.1	4.51	94.1	20.7	4.54	126.1	28.2	4.48	152.2	33.9	4.49
		7	68.1	14.2	4.81	85.7	18.2	4.72	98.3	20.7	4.74	131.9	28.3	4.66	159.0	34.1	4.67
	Water	10	75.0	14.1	5.32	95.3	18.6	5.13	110.1	21.3	5.17	146.1	29.0	5.04	176.9	34.8	5.08
		15	84.8	14.2	5.98	105.6	18.4	5.73	123.4	21.1	5.85	163.3	29.0	5.63	197.4	35.4	5.57
45	Brine	-5	47.5	15.7	3.03	62.5	20.5	3.05	70.6	23.1	3.05	93.7	31.4	2.99	115.9	37.0	3.13
		-2	52.2	15.7	3.33	67.6	20.4	3.30	77.2	23.1	3.35	102.8	31.3	3.28	125.5	37.1	3.38
		0	55.4	15.7	3.53	71.1	20.4	3.48	81.5	23.0	3.54	108.9	31.3	3.48	132.0	37.2	3.55
		2	58.6	15.7	3.73	74.8	20.4	3.67	85.9	23.0	3.73	114.9	31.2	3.68	138.7	37.3	3.72
		5	63.3	15.7	4.03	80.5	20.3	3.97	92.5	23.0	4.03	124.0	31.2	3.97	149.1	37.5	3.98
		7	66.5	15.7	4.23	84.3	20.3	4.16	96.8	22.9	4.22	130.0	31.2	4.17	155.9	37.6	4.15
	Water	10	73.1	15.5	4.72	93.5	20.6	4.54	107.5	23.5	4.57	143.0	31.9	4.48	172.7	38.4	4.50
		15	82.7	15.6	5.31	103.6	20.5	5.04	119.9	23.3	5.14	158.1	31.9	4.96	191.3	39.2	4.89
50	Brine	-5	47.1	17.1	2.76	61.8	22.5	2.75	70.3	26.1	2.69	93.5	35.5	2.63	114.2	41.9	2.72
		-2	51.1	17.2	2.98	66.9	22.5	2.97	76.6	25.9	2.96	102.2	35.0	2.92	123.7	41.6	2.97
		0	53.9	17.2	3.13	70.3	22.6	3.11	80.8	25.8	3.14	107.9	34.8	3.10	130.1	41.5	3.14
		2	57.0	17.2	3.32	73.7	22.6	3.26	84.9	25.7	3.30	113.5	34.7	3.27	136.8	41.6	3.29
		5	62.1	17.1	3.62	78.9	22.6	3.50	91.0	25.7	3.54	121.8	34.8	3.50	146.9	41.8	3.51
		7	65.3	17.1	3.82	82.3	22.5	3.65	95.1	25.7	3.70	127.4	34.9	3.65	153.6	41.9	3.66
	Water	10	71.7	17.2	4.17	91.6	22.6	4.05	104.8	25.7	4.08	140.0	34.9	4.01	168.5	42.0	4.02
		15	80.9	17.2	4.70	101.6	22.7	4.48	116.4	25.5	4.56	152.9	34.8	4.39	185.3	42.9	4.32
55	Brine	-5	46.5	18.6	2.50	62.1	24.2	2.56	70.5	28.3	2.49	92.8	38.5	2.41	113.7	45.5	2.50
		-2	49.9	18.7	2.67	66.8	24.2	2.77	76.6	27.7	2.76	101.7	37.4	2.72	122.0	44.4	2.75
		0	52.5	18.7	2.80	70.0	24.1	2.90	80.6	27.4	2.94	107.4	36.8	2.92	127.8	43.9	2.91
		2	55.5	18.7	2.97	73.2	24.1	3.03	84.4	27.3	3.09	112.8	36.7	3.07	134.2	43.9	3.06
		5	60.7	18.6	3.27	77.9	24.1	3.24	90.1	27.3	3.30	120.5	37.0	3.26	144.5	44.3	3.26
		7	64.0	18.5	3.46	81.1	24.1	3.37	93.9	27.3	3.44	125.7	37.1	3.39	151.2	44.5	3.40
	Water	10	70.2	18.8	3.73	89.7	24.6	3.64	102.2	27.9	3.66	136.9	37.8	3.62	164.3	45.5	3.61
		15	79.0	18.8	4.21	99.6	24.8	4.02	112.9	27.7	4.07	147.7	37.7	3.92	179.3	46.6	3.85
62	Brine	-5	45.0	20.8	2.16	59.6	27.4	2.18	68.1	32.5	2.10	89.6	44.1	2.03	109.8	51.9	2.12
		-2	48.2	20.9	2.30	64.7	27.8	2.33	73.9	32.1	2.30	98.0	43.5	2.25	118.4	51.4	2.30
		0	50.7	20.9	2.42	68.0	28.0	2.43	77.8	31.9	2.43	103.6	43.2	2.40	124.3	51.2	2.43
		2	53.7	20.9	2.57	71.0	28.0	2.54	81.6	31.8	2.57	108.9	43.0	2.53	130.6	51.2	2.55
		5	58.7	20.7	2.84	75.3	27.9	2.70	87.4	31.7	2.76	116.7	42.8	2.72	140.5	51.3	2.74
		7	62.0	20.6	3.01	78.2	27.8	2.81	91.3	31.6	2.88	121.9	42.7	2.85	147.0	51.3	2.86
	Water	10	67.6	20.9	3.24	87.1	27.5	3.17	98.5	31.0	3.18	132.7	42.0	3.16	158.4	50.5	3.14
		15	76.2	20.8	3.66	96.8	27.7	3.49	108.0	30.8	3.50	140.4	41.7	3.37	170.9	51.8	3.30

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

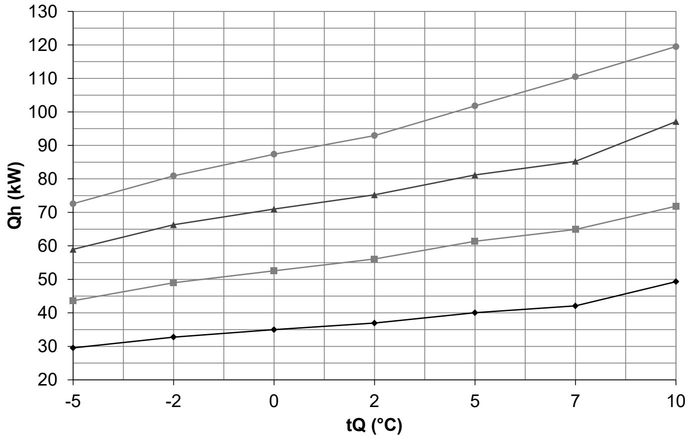
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data - heating

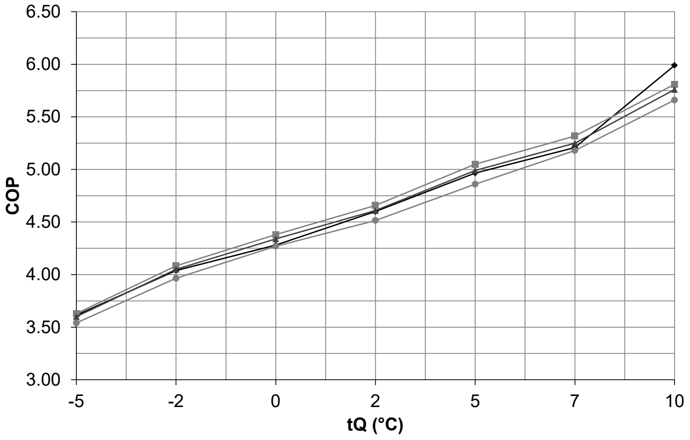
Maximum heat output

Thermalia® dual H (35-90) with R134a

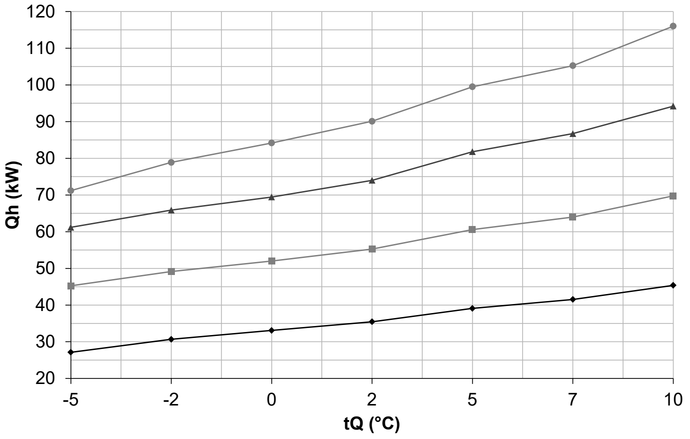
Heat output - t_{VL} 35 °C



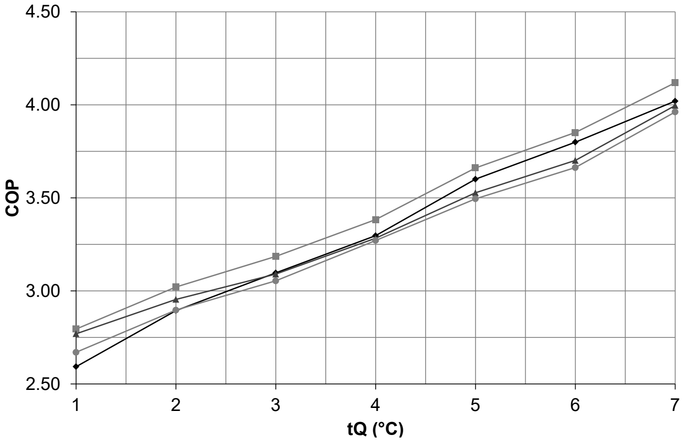
Output rating - t_{VL} 35 °C



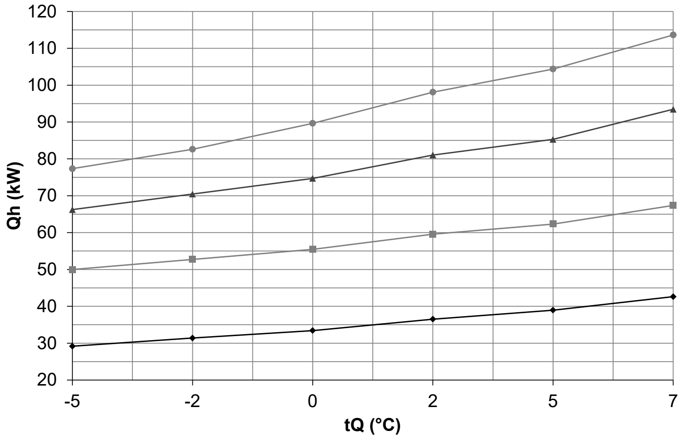
Heat output - t_{VL} 50 °C



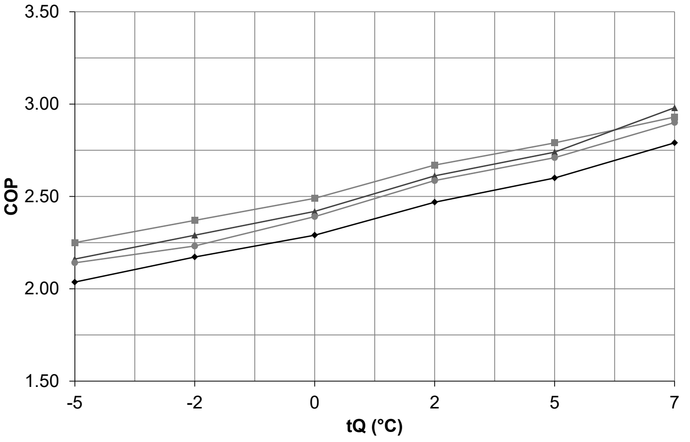
Output rating - t_{VL} 50 °C



Heat output - t_{VL} 65 °C



Output rating - t_{VL} 65 °C



tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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)	
tVL °C		tQ °C	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP	Qh kW	P kW	COP
35	Brine	-5	29.5	8.2	3.61	43.6	12.0	3.63	59.0	16.4	3.60	72.6	20.5	3.54
		-2	32.8	8.1	4.04	49.0	12.0	4.08	66.3	16.4	4.05	80.9	20.4	3.97
		0	35.0	8.1	4.32	52.5	12.0	4.38	71.0	16.4	4.34	87.4	20.3	4.30
		2	37.0	8.0	4.60	56.1	12.0	4.66	75.2	16.3	4.61	92.9	20.6	4.51
		5	40.0	8.1	4.97	61.4	12.2	5.05	81.2	16.3	4.99	101.8	20.9	4.86
		7	42.1	8.1	5.21	64.9	12.2	5.32	85.2	16.2	5.25	110.5	21.3	5.18
	Water	10	49.3	8.2	5.99	71.8	12.4	5.81	97.1	16.9	5.76	119.5	21.1	5.66
40	Brine	-5	28.7	9.0	3.20	44.4	13.2	3.36	60.0	18.0	3.33	71.9	22.4	3.22
		-2	32.1	9.1	3.54	49.1	13.2	3.71	66.1	18.0	3.66	80.2	22.4	3.57
		0	34.5	9.1	3.78	52.4	13.3	3.95	70.2	18.1	3.88	86.1	22.5	3.82
		2	36.7	9.0	4.08	55.8	13.3	4.20	74.6	18.1	4.12	91.7	22.4	4.09
		5	40.1	9.0	4.43	61.0	13.5	4.53	81.4	18.5	4.40	100.4	23.3	4.31
		7	42.4	9.1	4.66	64.5	13.5	4.77	85.9	18.6	4.61	107.2	23.6	4.54
	Water	10	47.5	9.2	5.19	71.2	13.7	5.18	95.8	19.0	5.04	118.1	23.7	4.98
45	Brine	-5	27.8	9.7	2.86	45.1	14.6	3.09	61.0	19.9	3.06	71.4	24.4	2.92
		-2	31.5	9.8	3.20	49.7	14.7	3.39	66.0	19.9	3.32	79.5	24.7	3.22
		0	33.9	9.9	3.44	52.8	14.7	3.58	69.7	19.9	3.50	85.0	24.9	3.41
		2	36.4	9.9	3.66	55.8	14.8	3.77	74.0	20.2	3.66	90.8	25.3	3.59
		5	40.1	10.2	3.92	60.3	14.9	4.04	81.2	20.9	3.89	99.6	25.8	3.86
		7	42.6	10.3	4.14	63.3	15.0	4.22	85.8	21.2	4.04	105.5	26.1	4.04
	Water	10	46.6	10.2	4.58	70.4	15.3	4.61	94.6	21.4	4.43	116.9	26.4	4.42
50	Brine	-5	27.1	10.5	2.59	45.3	16.2	2.80	61.2	22.1	2.77	71.2	26.7	2.67
		-2	30.7	10.6	2.89	49.1	16.3	3.02	65.9	22.3	2.95	78.9	27.2	2.90
		0	33.1	10.7	3.10	52.0	16.3	3.19	69.5	22.5	3.09	84.2	27.6	3.05
		2	35.5	10.8	3.30	55.2	16.3	3.38	74.0	22.5	3.28	90.1	27.5	3.27
		5	39.1	10.9	3.60	60.6	16.5	3.66	81.8	23.2	3.53	99.5	28.5	3.50
		7	41.5	10.9	3.80	64.0	16.6	3.85	86.7	23.4	3.70	105.3	28.7	3.66
	Water	10	45.4	11.3	4.02	69.8	16.9	4.12	94.2	23.6	4.00	116.0	29.3	3.96
55	Brine	-5	26.4	11.5	2.30	45.1	18.0	2.51	61.0	24.5	2.49	71.2	29.1	2.45
		-2	29.9	11.7	2.56	48.6	18.0	2.70	65.8	25.0	2.63	78.3	30.0	2.61
		0	32.2	11.8	2.74	51.3	18.1	2.84	69.5	25.3	2.75	83.5	30.5	2.74
		2	34.5	11.9	2.91	54.8	18.2	3.02	74.2	25.5	2.92	89.7	30.9	2.91
		5	38.1	12.0	3.18	60.8	18.3	3.32	82.2	25.6	3.21	99.9	31.3	3.20
		7	40.4	12.1	3.35	64.6	18.4	3.51	87.3	25.7	3.40	106.5	31.5	3.38
	Water	10	44.8	12.5	3.58	69.0	18.8	3.68	94.1	25.9	3.63	115.4	32.2	3.58
65	Brine	-5	-	-	-	-	-	-	-	-	-	-	-	-
		-2	29.2	14.3	2.04	50.0	22.2	2.25	66.2	30.6	2.16	77.3	36.1	2.14
		0	31.4	14.5	2.17	52.7	22.2	2.37	70.5	30.8	2.29	82.6	37.0	2.23
		2	33.4	14.6	2.29	55.5	22.3	2.49	74.7	30.9	2.42	89.6	37.5	2.39
		5	36.5	14.8	2.47	59.6	22.3	2.67	81.0	31.0	2.61	98.1	37.9	2.59
		7	39.0	15.0	2.60	62.3	22.3	2.79	85.3	31.1	2.74	104.4	38.5	2.71
	Water	10	42.6	15.3	2.79	67.4	23.0	2.93	93.5	31.4	2.98	113.6	39.2	2.90

tVL = heating flow temperature (°C)
tQ = source temperature (°C)
Qh = 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

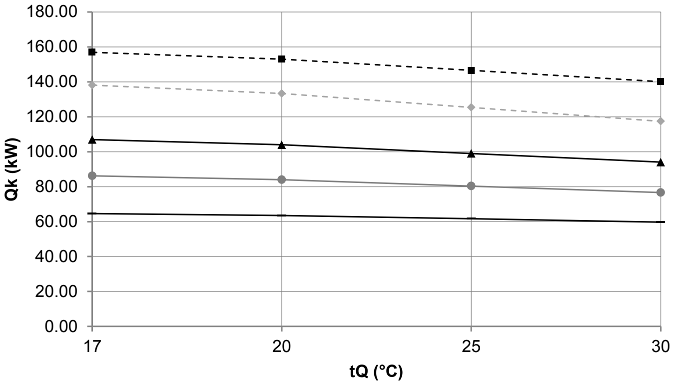
Observe daily power interruptions!
see “Engineering heat pumps general”

Performance data – cooling

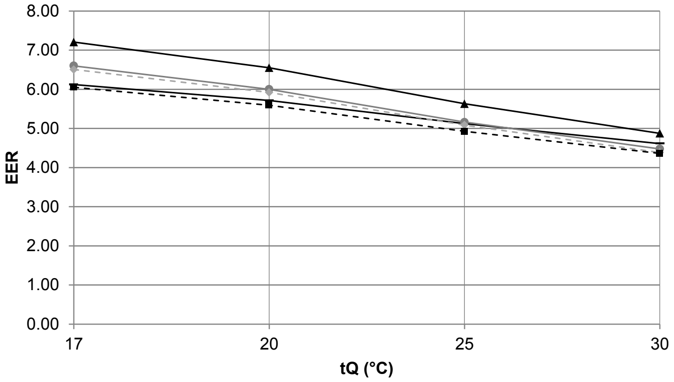
Maximum cooling capacity

Thermalia® dual R (55-140) with R410A

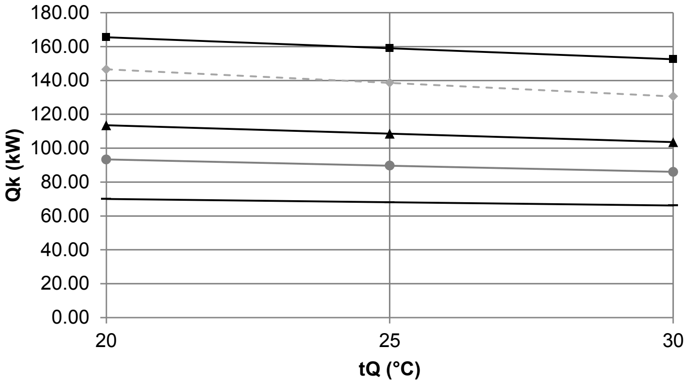
Cooling capacity - t_{FL} 9 °C



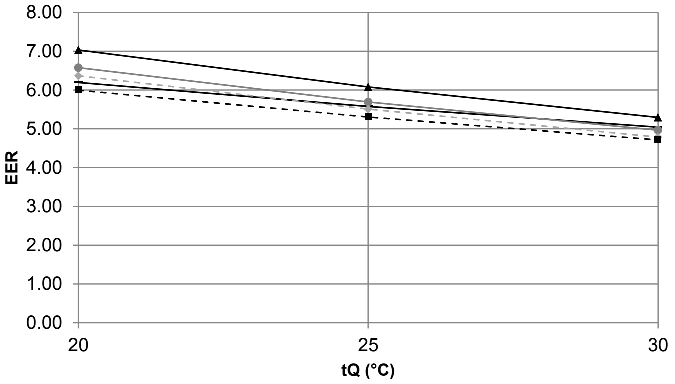
Coefficient of performance - t_{FL} 9 °C



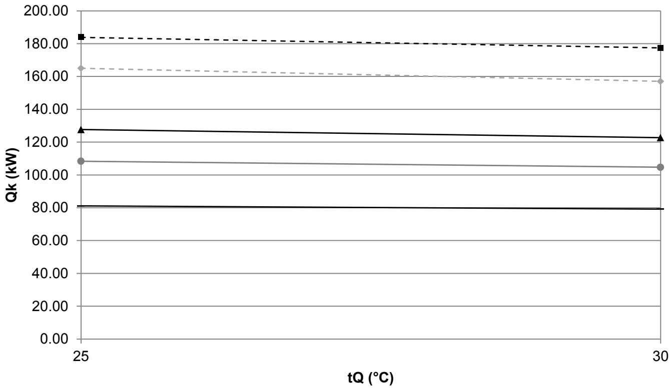
Cooling capacity - t_{FL} 12 °C



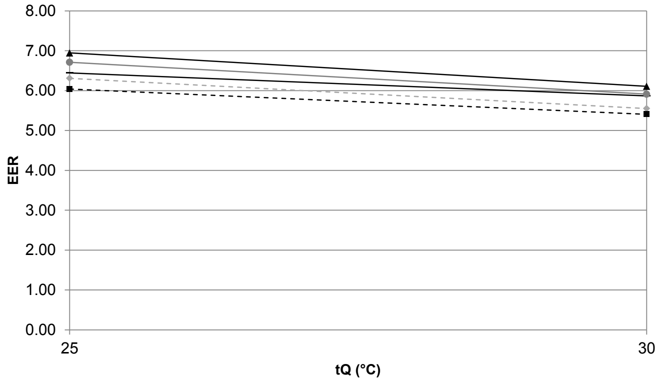
Coefficient of performance - t_{FL} 12 °C



Cooling capacity - t_{FL} 18 °C



Coefficient of performance - t_{FL} 18 °C



tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
EER = Coefficient of performance 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 tFL °C	Heat source Medium t1	tQ °C	R (55)			R (70)			R (85)			R (110)			R (140)		
			Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER	Qk kW	P kW	EER
9	Brine (Sole)	17	64.66	10.56	6.12	86.20	13.06	6.60	106.97	14.84	7.21	138.10	21.23	6.51	156.90	25.92	6.05
		20	63.52	11.11	5.72	84.00	14.00	6.00	103.98	15.87	6.55	133.33	22.51	5.92	153.02	27.35	5.59
		25	61.62	12.03	5.12	80.34	15.56	5.16	99.00	17.58	5.63	125.37	24.65	5.09	146.56	29.74	4.93
		30	59.72	12.94	4.61	76.67	17.13	4.48	94.02	19.29	4.87	117.42	26.79	4.38	140.09	32.12	4.36
12	Brine (Sole)	20	70.02	11.30	6.20	93.34	14.19	6.58	113.55	16.14	7.04	146.53	23.01	6.37	165.46	27.59	6.00
		25	68.12	12.21	5.58	89.67	15.76	5.69	108.57	17.85	6.08	138.57	25.15	5.51	158.99	29.97	5.30
		30	66.22	13.13	5.04	86.01	17.32	4.97	103.59	19.56	5.30	130.62	27.29	4.79	152.52	32.36	4.71
15	Brine (Sole)	25	74.61	12.40	6.02	99.01	15.95	6.21	118.15	18.12	6.52	151.77	25.65	5.92	171.42	30.20	5.68
		30	72.71	13.31	5.46	95.34	17.52	5.44	113.17	19.83	5.71	143.82	27.79	5.18	164.96	32.59	5.06
18	Brine (Sole)	25	81.11	12.59	6.44	108.34	16.15	6.71	127.72	18.39	6.95	164.97	26.15	6.31	183.86	30.44	6.04
		30	79.21	13.50	5.87	104.68	17.71	5.91	122.74	20.10	6.11	157.02	28.29	5.55	177.39	32.82	5.40

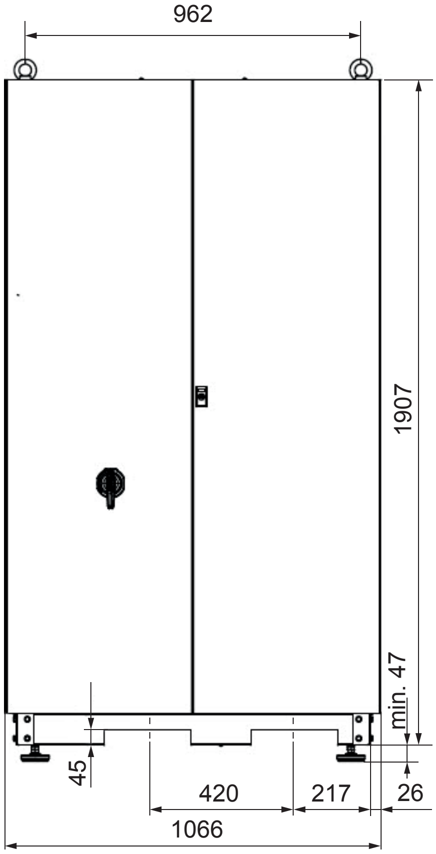
tFL = Cooling water flow temperature (°C)
tQ = Source temperature (°C)
Qk = Cooling capacity (kW), measured in accordance with standard EN 14511
P = Power consumption of the overall unit (kW) incl. high-efficiency pump, measured in accordance with EN 14511
EER = Coefficient of performance for the overall unit in accordance with standard EN 14511

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

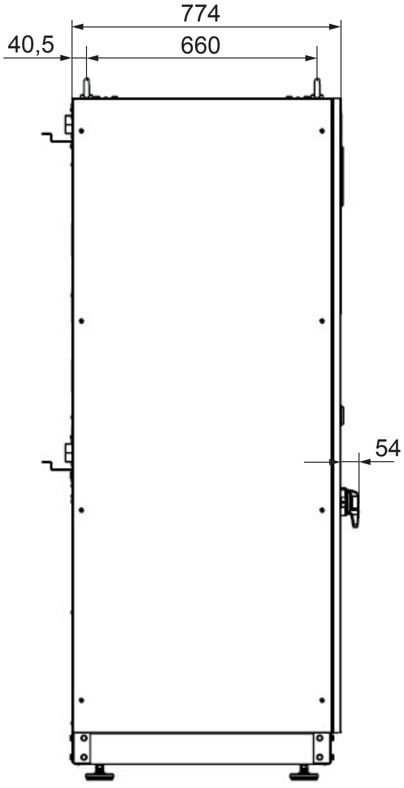
Thermalia® dual (55-85), dual H (35), dual R (55-85)

(Dimensions in mm)

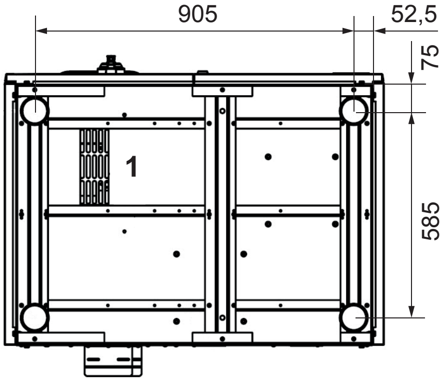
Front view



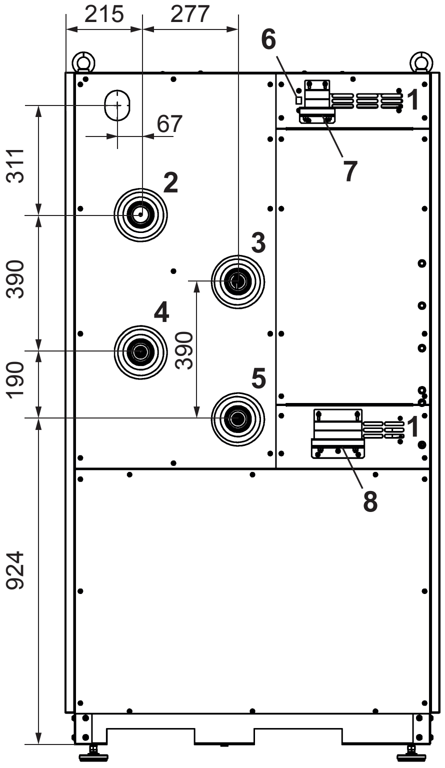
Side view



View from below



Rear view



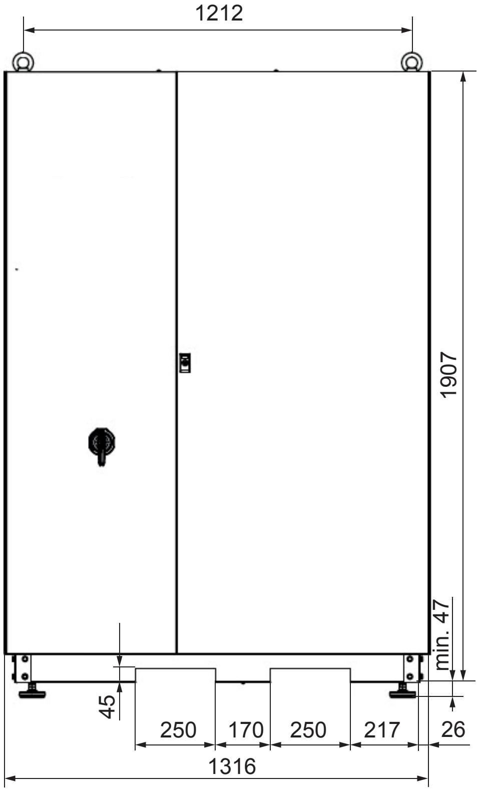
Adjustable feet
with M12 thread

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

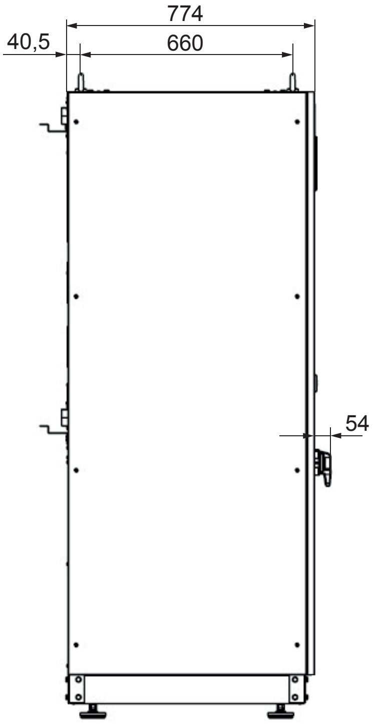
Thermalia® dual (110-140), dual H (50-90), dual R (110-140)

(Dimensions in mm)

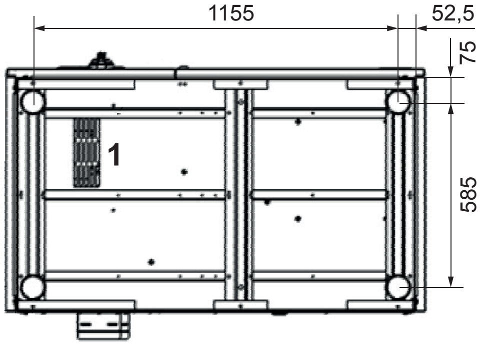
Front view



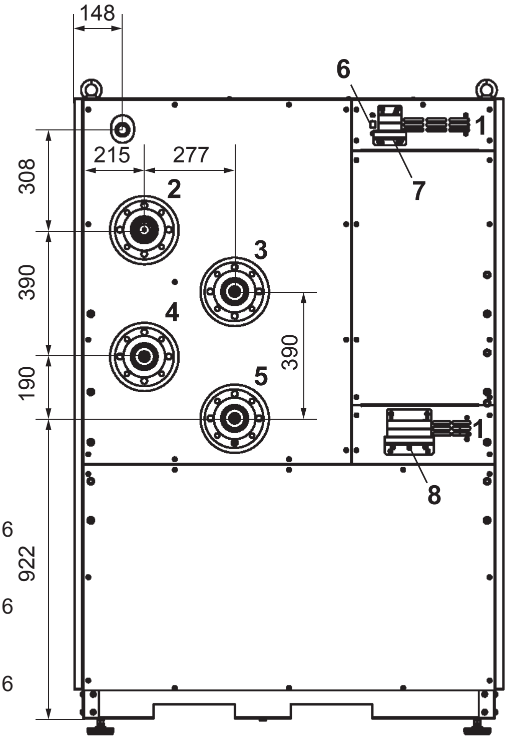
Side view



View from below



Rear view



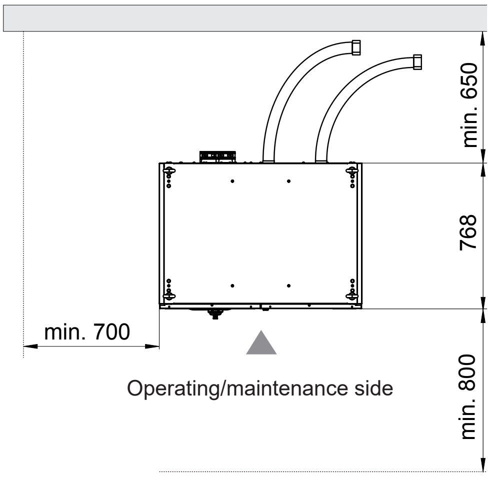
1 Vent opening
2 Flow heating or storage tank
  Thermalia® dual H (50,70) Rp 2″
  Thermalia® dual, dual R (110,140), dual H (90) flange DN80/PN6
3 Brine or ground water inlet
  Thermalia® dual H (50,70) Rp 2″
  Thermalia® dual, dual R (110,140), dual H (90) flange DN80/PN6
4 Return heating or storage tank
  Thermalia® dual H (50,70) Rp 2″
  Thermalia® dual, dual R (110,140), dual H (90) flange DN80/PN6
5 Brine or ground water outlet
  Thermalia® dual H (50,70) Rp 2″
  Thermalia® dual, dual R (110,140), dual H (90) flange DN80/PN6
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

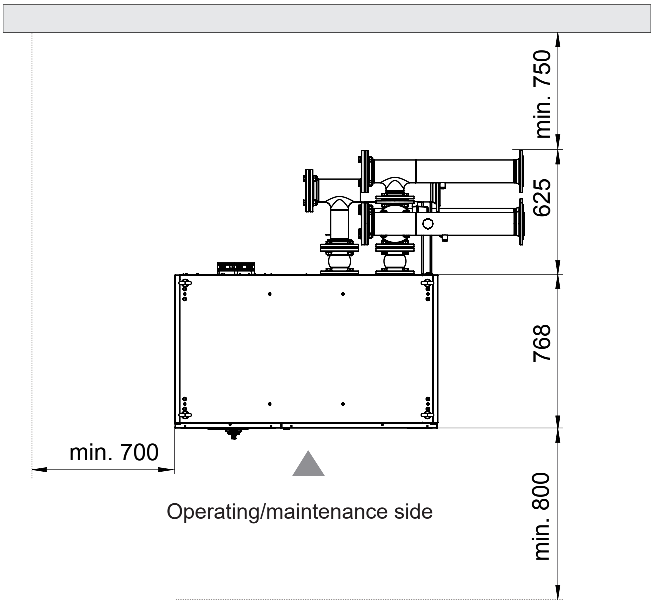
Space requirement

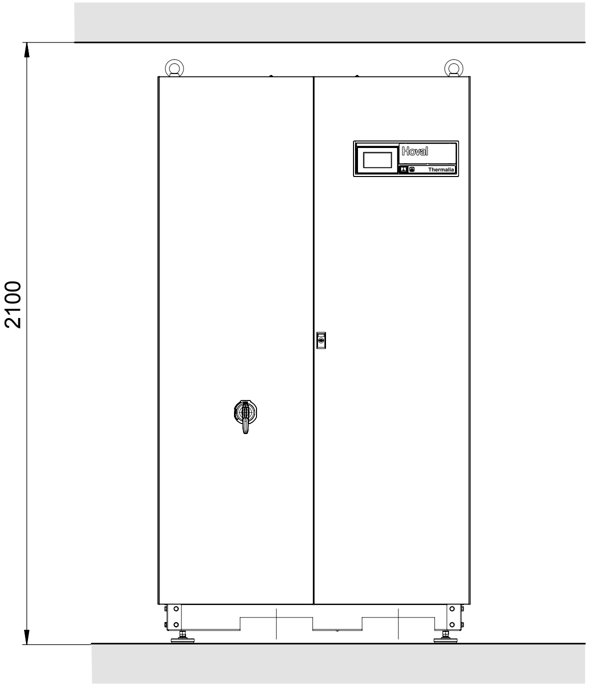
Required wall clearance for operation and maintenance
(Dimensions in mm)

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



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

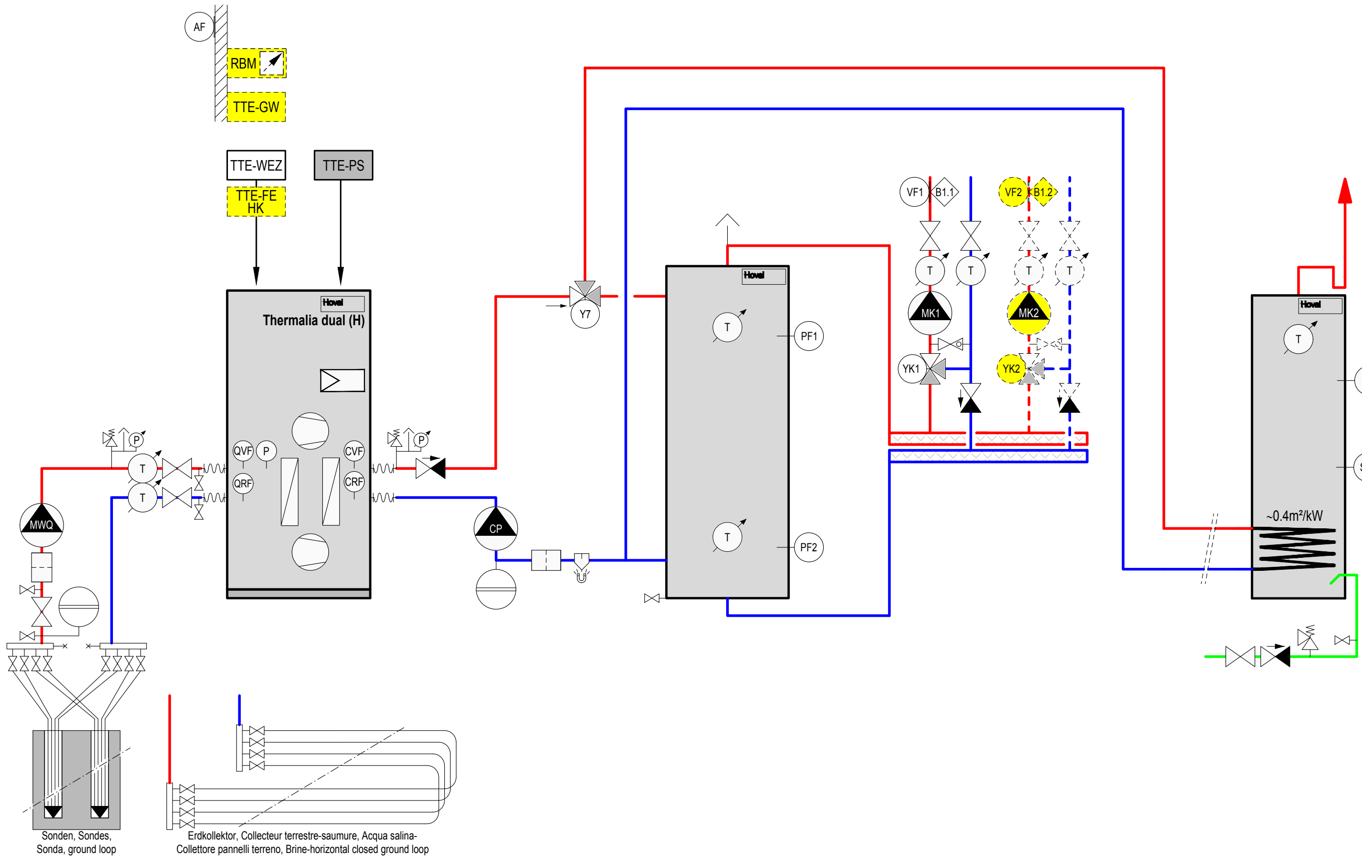




Thermalia® dual

Brine/water-water/water heat pump with
- energy buffer storage tank
- calorifier
- 1-... mixer circuit(s)

Hydraulic schematics BBBDE020



TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-PS	TopTronic® E buffer module
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
PF1	Buffer sensor 1
PF2	Buffer sensor 2
Y7	Switching valve
CP	Condenser pump
MWQ	Delivery pump in heat source intermediate circuit (cold-water design)

Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

Important notices
- The example schematics merely show the basic principle and do not contain all information required for installation. Installation must be carried out according to the conditions on-site, dimensioning and local regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety equipment (pressure expansion tank, safety valve, etc.) must be secured against unintentional closing!
- Install sacks to prevent single-pipe gravity circulation!

Requirements and directives

The following requirements and directives must be complied with:

- Technical information and installation 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.
- Country-specific and regional regulations and laws, in particular
- 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

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 93-1 guidelines “Safety engineering installations for heating systems”
- Bivalent plants: 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 imissions 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 2007) 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

- Energy Conservation Ordinance (EnEV)
- Renewable Energies Heating Law (EEWärmeG)
- Drinking Water Ordinance (TrinkwV)
- DVGW worksheets W 551 and W 553
- DIN EN 15450: Heating systems in buildings - Design of heat pump heating systems

Energy buffer storage tank

An energy 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

Hoval Belaria® twin air/water heat pumps and Thermalia® twin and Thermalia® dual brine/water heat pumps require an energy buffer storage tank.

An energy buffer storage tank can be dispensed with if the following pre-conditions are met:

Switzerland and Austria:
If there is a direct circuit of panel heating with storage capacity and a constant flow rate (2/3 must be incapable of being shut off; exception: Hoval Belaria® twin I, twin IR, twin A, twin AR).

Germany:

- Underfloor heating with storage capability and constant flow rate at all times through the heating system and heat pump
- The system volume must be at least 15 litres water content per kW heat output of the heat pump at the standard point W10W35, B0W35 or A2/W35
- A bypass with relief valve must be installed to ensure the minimum flow rate is achieved. The minimum water content of 15 litres/kW heat output is required between heat pump and bypass.

The energy buffer storage tank has the following dimensions:

$$V_{SP} \geq \frac{220 \cdot \dot{Q}_{HP}}{\Delta t \cdot n} \quad [dm^3]$$

V_{SP} Volume of the energy buffer storage tank [dm³]
Q_{HP} Max. heat output of the heat pump [kW] In 2-stage machines, the output of stage 1 should be used in the calculation
Δt Temperature difference between the on/off command
n Switching frequency per hour (maximum 3)

Energy buffer storage tank for optimising running time:
If the minimum volume cannot be met by panel heating, a minimum volume of 20 l/kW is to be recommended for the design of the energy buffer storage tank.

The energy buffer storage tank must be made correspondingly larger in order to bridge periods when the electricity is switched off by the energy company, in particular in the case of radiator heating systems.

Set-up

The Hoval Thermalia® and Belaria® heat pumps can be mounted without a base in the boiler room.

- 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 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.

Noise emissions

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.
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 noise 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.
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 imission 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. The heat source is not designed for the heat pump!

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 energy 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.

Example:
Calculated heat demand without off-periods:
10 kW (in 24 hours)
Off-period: 2 x 2 hours = 4 hours
Electricity available: 20 hours

$$\frac{10\ \text{kW} \cdot 24\text{h}}{20\ \text{hours}} = 12\ \text{kW}$$

This results in a surcharge of 20 %.

Surcharges for typical off-periods:

Off-period	Surcharge
1 x 1 hour	5 %
1 x 2 hours	10 %
2 x 2 hours	20 %
3 x 2 hours	33 %

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.

Germany:
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 pipe to the heat pump.

Baking out
The baking out of buildings and floors must not be done with brine/water heat pumps (heat source linked to earth). If this instruction is not observed, the additional load can lead to irreparable damage to the heat source.
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.
Example of new systems:
Brine/water or water/water heat pumps.

Bivalent parallel and single energy source:
The heat pump alone heats until the switch-on point (bivalent point) is reached. An additional heater then heats the water in parallel to this. If this additional heater is an electric water heater, 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.
Example: New installation of air/water heat pumps and retrofitting during refurbishment of an old building.

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.
Example: Retrofitting during refurbishment of an old building

Bivalent semi-parallel:
The heat pump alone heats until the switch-on point (bivalent point) is reached. An additional heater 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 compressor. Used for setting the dimensions of the feeder cable and fusing.

Blocking current referred to as LRA (A) = Current consumption on direct starting. Used for assessing the system perturbation (voltage dip)

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, a frequency converter must be supplied or installed by the client.

For brine/water heat pumps with flow temperatures higher than 60 °C and all air/water heat pumps

Maximum filling quantity without/with demineralisation

	Total hardness of the filling and replacement water depending on the specific system volume			**Max. permissible total alkaline earths**
Total output of heat pump(s)	< 20 litres/kW	> 20 litres/kW and < 50 litres/kW	> 50 litres/kW	[mol/m³]
< 50 kW	< 16.8 °dH	< 11.2 °dH	< 0.11 °dH	no requirement
50 - 200 kW	< 11.2 °dH	< 8.4 °dH	< 0.11 °dH	< 2.0
200 - 600 kW	< 8.4 °dH	< 0.11 °dH	< 0.11 °dH	< 1.5
> 600 kW	< 0.11 °dH	< 0.11 °dH	< 0.11 °dH	< 0.02
	Max. permissible electrical conductivity depending on the oxygen content of the system volume			
	O_2 < 0.02 mg/l “containing salt”		**O_2 > 0.02 mg/l and < 0.1 mg/l “low-salt”**	
	< 1500 µS/cm		< 100 µS/cm	

Water quality

Heating water:

- The requirements of European standard EN 14868 and VDI 2035 or SIA 384/1:2009 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 a **system separation.**
- Treated heating water must be tested at least 1x per 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 VDI 2035, re-filling the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- 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 mains water. However, the quality of the untreated mains water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. 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

Engineering checklist for heat pump systems

Hoval Belaria® SRM, compact SRM, SHM air/water heat pump (split design)

- Installation location of outdoor unit/position: air outlet and intake must be clear
- No parts and plants 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 adhered to (TA-Lärm).
- There must be a condensate drain from 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 bypass valve (minimum flow rate) and intermediate tank (minimum water volume)
- Definition of hydraulic diagram according to Hoval standard for heating and possibly hot water
- Dimensions of heat pump type selected according to Qh, flow temperature and operating method. (Table/heat output curves/bivalence point)
- Poss. selection of type with cooling function
- Cooling with fan coils (important: condensate drain with fan coils)
- Clarification of electrical supply with energy supply company (conditions/off-periods/connected load)
- Clarification of subsidy amounts and ancillary conditions

Hoval Thermalia® brine/water heat pump

- 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)
- Definition of hydraulic diagram according to Hoval standard for heating and possibly hot water (combination with solar, possible cascade connection according to Hoval system technology)
- Passive cooling according to configuration based on Hoval system technology.
- Dimensions of heat pump type selected according to Qh, flow temperature and operating method. (Table/heat output curves/bivalence point)
- Possible 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

Hoval Belaria® twin I, twin IR and Belaria® twin A, twin AR air/water heat pump

- Installation location (indoor or outdoor installation). Air outlet and intake must be clear. Comply with notices on air guidance.
- No parts and plants 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 adhered to (TA-Lärm). Provide attenuation measures if required.
- There must be a condensate drain
- Definition of hydraulic diagram according to Hoval standard for heating and possibly hot water preheating (combination with solar)
- Definition of heat pump type according to Qh and flow temperature (table)
- Define size of buffer storage tank
- Possibilities for transporting in (Belaria® twin I, twin IR)
- Dimensions of heat pump type selected according to Qh, flow temperature and operating method (tables/heat output curves/bivalence point)
- Possible configuration of calorifier with corresponding size and required heat register size (important: configure with A20W55)
- Positioning and integration of technical storage tank
- Clarification of electrical supply with energy supply company (conditions/off-periods/connected load)
- Clarification of subsidy amounts and ancillary conditions

Hoval Thermalia® ground source heat pump

- 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)
- Definition of hydraulic diagram according to Hoval standard for heating and possibly hot water
- Connection of ground water only via separating heat exchanger (intermediate carrier circuit). Separating heat exchanger is configured according to the heat pump type (table).
- Dimensions of heat pump type selected according to Qh, flow temperature and operating method. (Heat output table. Important: 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
- Passive cooling according to configuration based on Hoval system technology
- Possible 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

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 Thermalia® and Belaria® heat pumps
- Access for the purpose of operation and maintenance
- Dimensions and position of the masonry openings
- Position of the heating and condensate drain connections
- Position of the condensate drain in the room
- Drainage of the area ducts or set-up area for the Belaria® and acoustic insulation of the air ducts
- Installation of Belaria® outdoor unit

Hydraulics

- Check the hydraulic piping of the system according to be selected schematic diagram
- Clarify any open issues before installation
- The electrical diagram does not serve as a hydraulic diagram, 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 a flexible way
- The information on the plant 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 2007)
- If a frequency converter is required (inrush current), it must be supplied by the client

Checks before commissioning

The following items must be checked before notifying Hoval that the plant is ready for commissioning:

- Hydraulic piping
- Positioning and installation of the instruments and fittings
- Positioning and installation of the sensors according to the corresponding electrical 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 antifreeze and water:

- Fully demineralised water must be used
- The concentration of antifreeze 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 antifreeze manufacturer is maintained (protection against sludge formation and corrosion). However, the antifreeze concentrations should be kept as low as possible with a view to improved heat transmission and lower pump output (SIA standard 384-6 § 4.5.2).
- The antifreeze 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.

Hydraulic calibration

- 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 should not be greater than the flow rate in the buffer circuit, otherwise the colder heating water return will overflow through the hot water 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 flow 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 the technical 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 load balancing storage tank (buffer) 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 plant 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

Caution!
If Hoval is required to undertake provisional commissioning in uninhabited building carcasses without the required general conditions and proficientlyundertaken 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 plant is responsible for the operating instructions and for providing instruction in third-party products and/or the entire system!
All Hoval conceptual drawings and engineering guidelines serve as aids during planning. The planner of the plant 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 annual COP that can be achieved, 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 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
- Noise emissions from pumping air
- Formation of condensation
- In coastal regions or other areas with salty air, corrosion can decrease the life-time of the evaporator

Ground

Setting up and operating geothermal probes and ground source collectors requires official approval. The heat capacity and heat 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 at any one time is always significantly greater 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
- Both systems have proven themselves in practice

Geothermal probes

The planning criteria are:
- VDI 4640
- The spec. heat extraction rate which depends on the thermal conductivity (λ) of the underground
- The max. heat extraction per year should not exceed 90 kWh per meter 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 system of geothermal probes**

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:
- VDI 4640
- Min. heat source temperature and flow rate during the utilisation period
- Min. permitted evaporator outlet temperature of the selected heat pump
- Official regulations such as type of use, configuration of the withdrawal and return well, etc.
- 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.

Preliminary information required for ground water
- Suitability regarding quantities and temperatures (t ≥ 8 °C)
- Official approval
- Hydro-geological report
- Water analysis
- The effective minimum ground water temperature

Remarks:
- The ground water temperature varies according to location
- Possibility of infiltration through water from rivers or lakes
- The design must be based on reliable temperature data
- The heat source system, (withdrawal and return well) must be installed professionally (by a specialist company)

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 lake/river water, etc. as the heat source is a challenging task and demands great experience from the planner. Due to the wide temperature fluctuations, direct use is only possible in exceptional cases. 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 groundwater use.

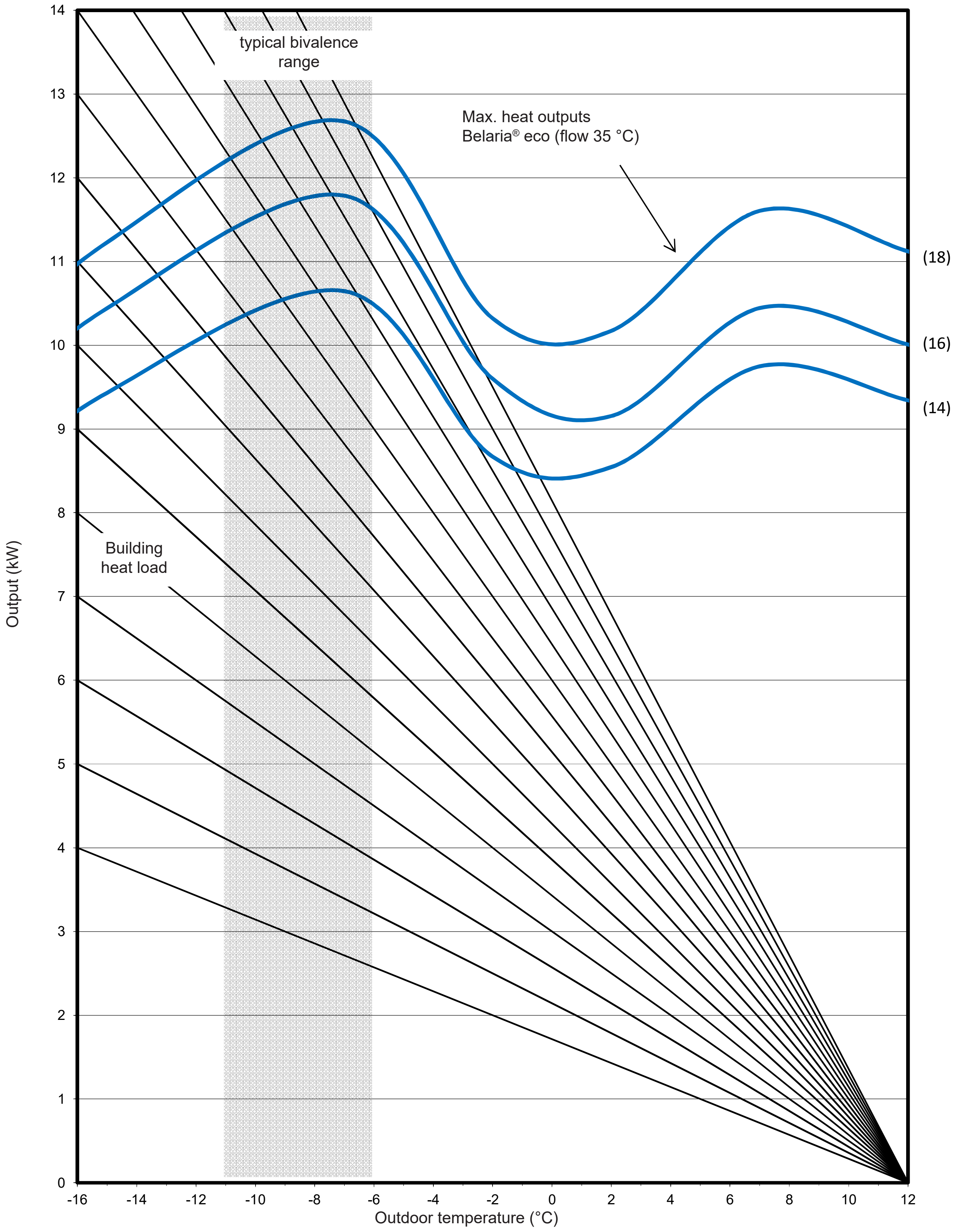
* A qualified specialist company must be contacted for planning and installing the heat source system.

Dimensions of the Belaria® eco, Belaria® eco compact 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® eco and Belaria® eco compact 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.

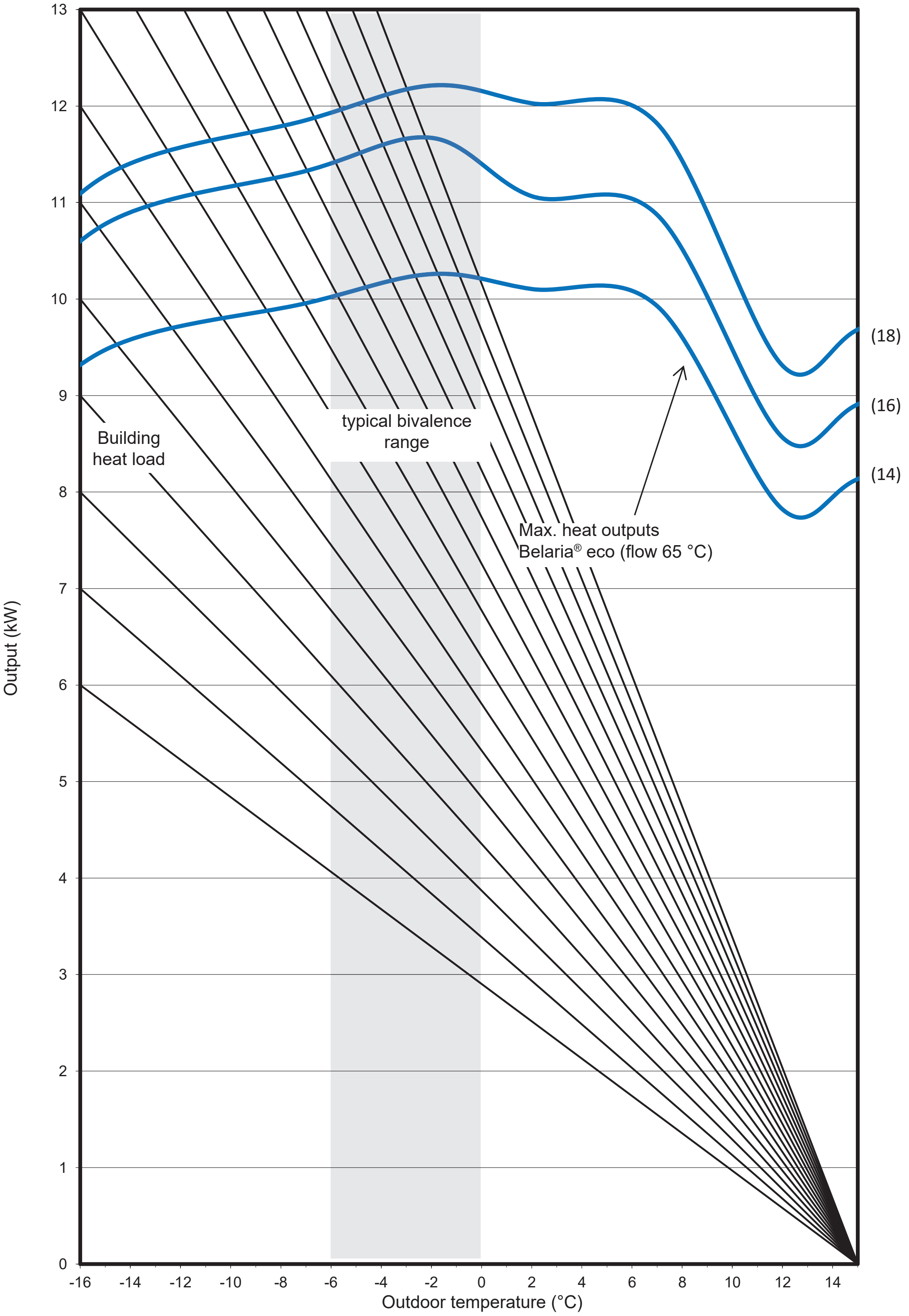


Dimensions of the Belaria® eco, Belaria® eco compact air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
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® eco and Belaria® eco compact at a flow temperature of 65 °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.

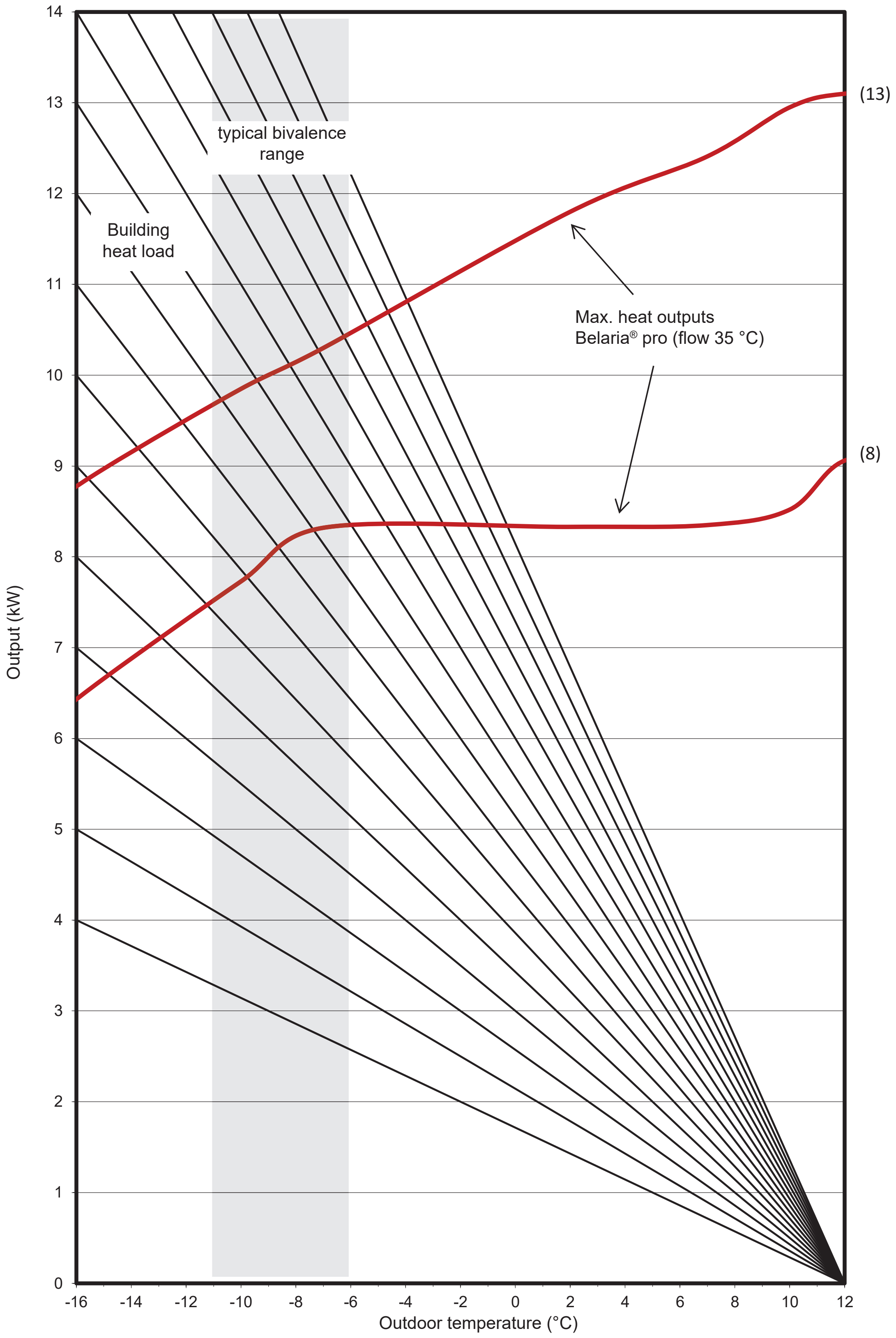


Dimensions of the Belaria® pro comfort, Belaria® pro compact air/water heat pump with panel heating

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® pro comfort and Belaria® pro compact 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.

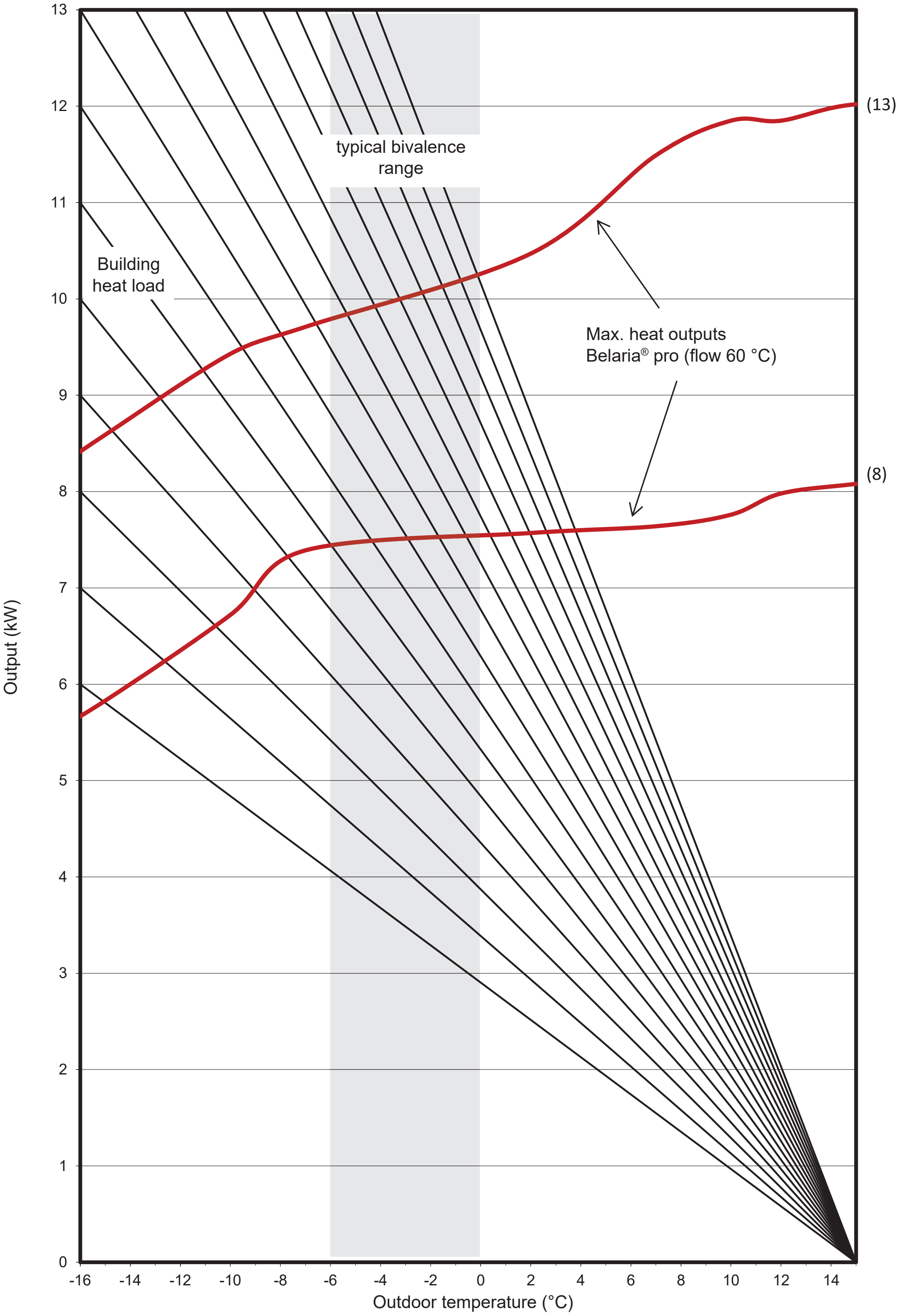


Dimensions of the Belaria® pro comfort, Belaria® pro compact air/water heat pump with radiator

Example:
Upgrade of older buildings with radiators.
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® pro comfort and Belaria® pro compact at a flow temperature of 60 °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.

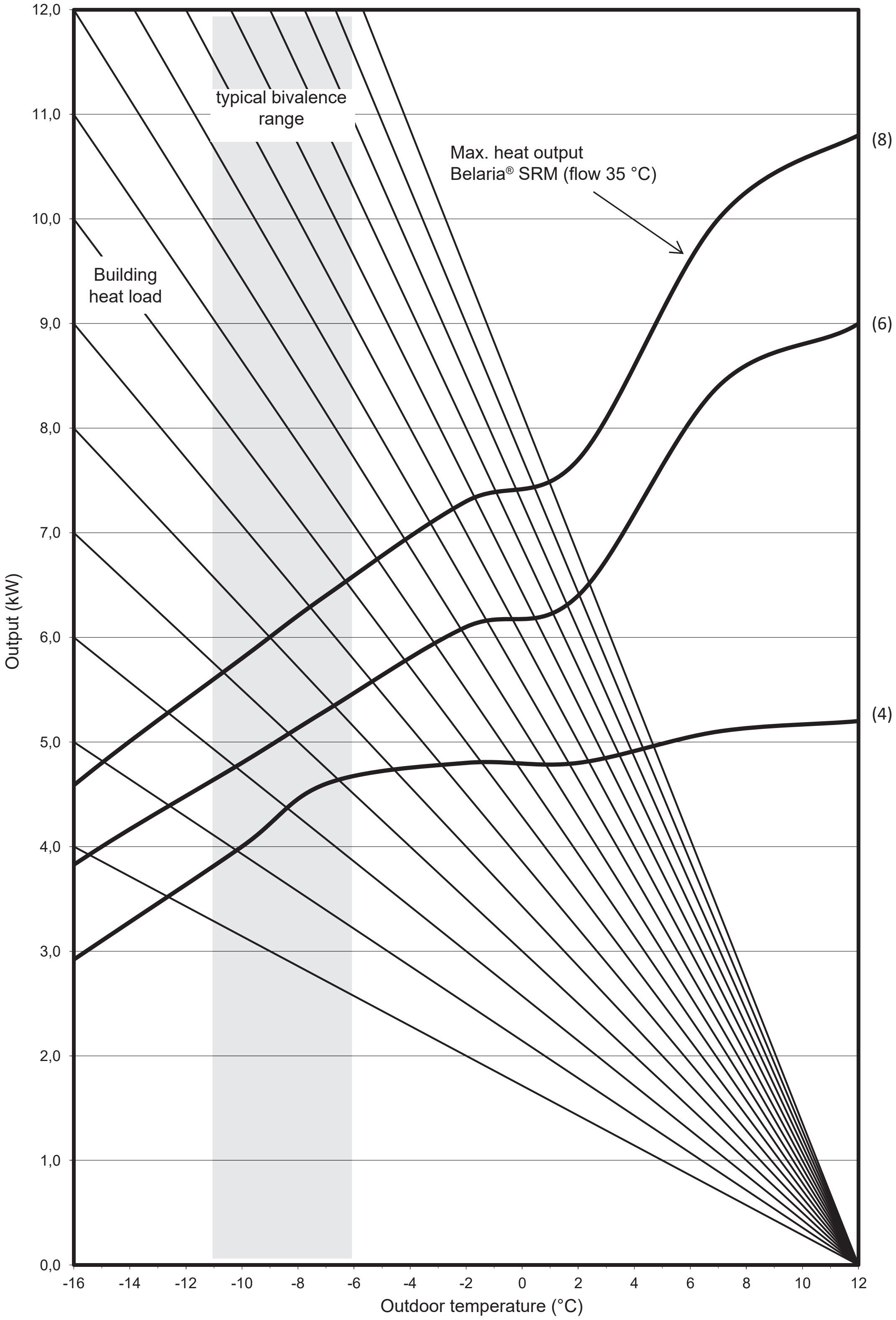


Dimensions of the Belaria® SRM and Belaria® compact SRM air/water heat pump with panel heating

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® SRM and Belaria® compact SRM 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.

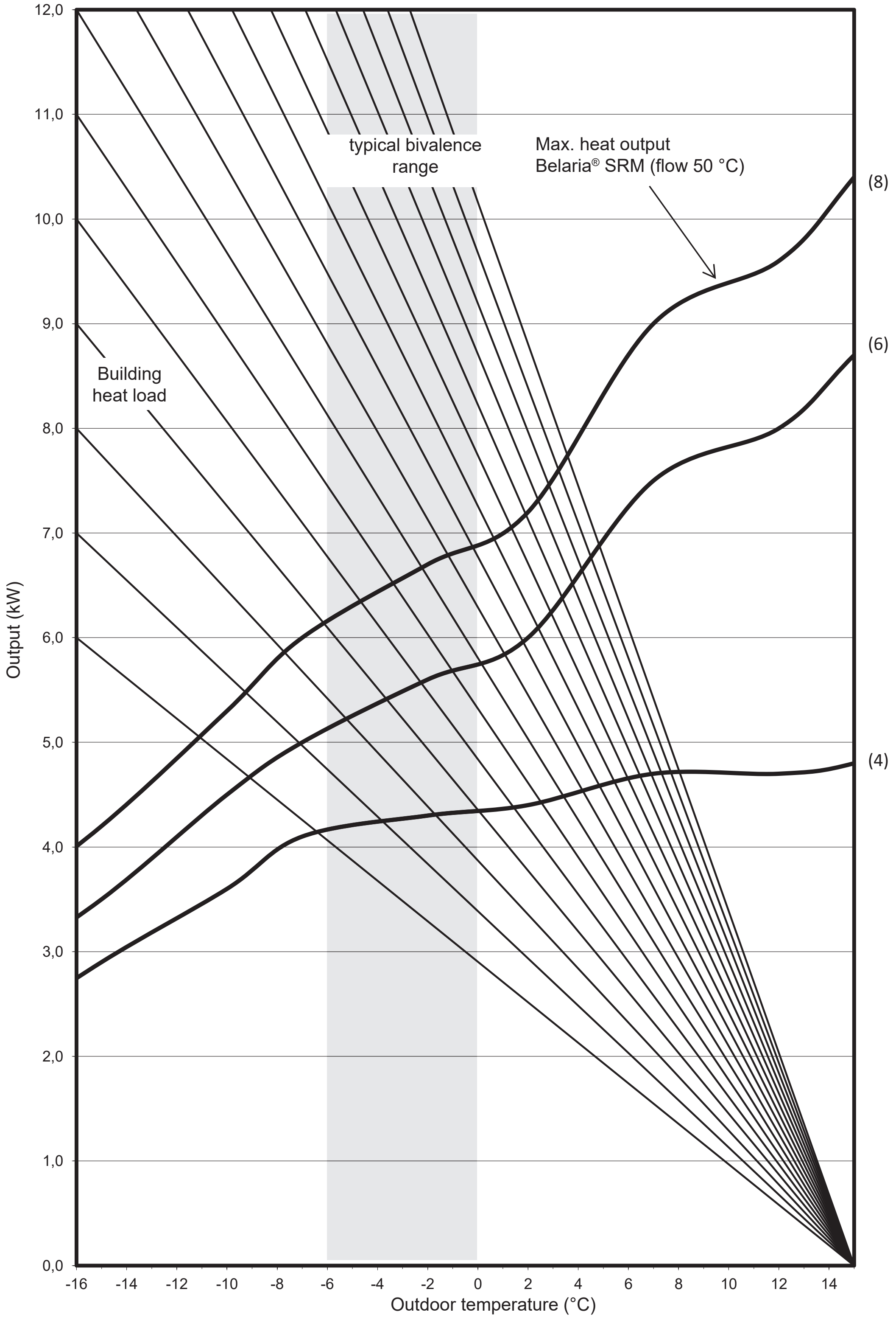


Dimensions of the Belaria® SRM and Belaria® compact SRM air/water heat pump with radiator

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® SRM and Belaria® compact SRM 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.

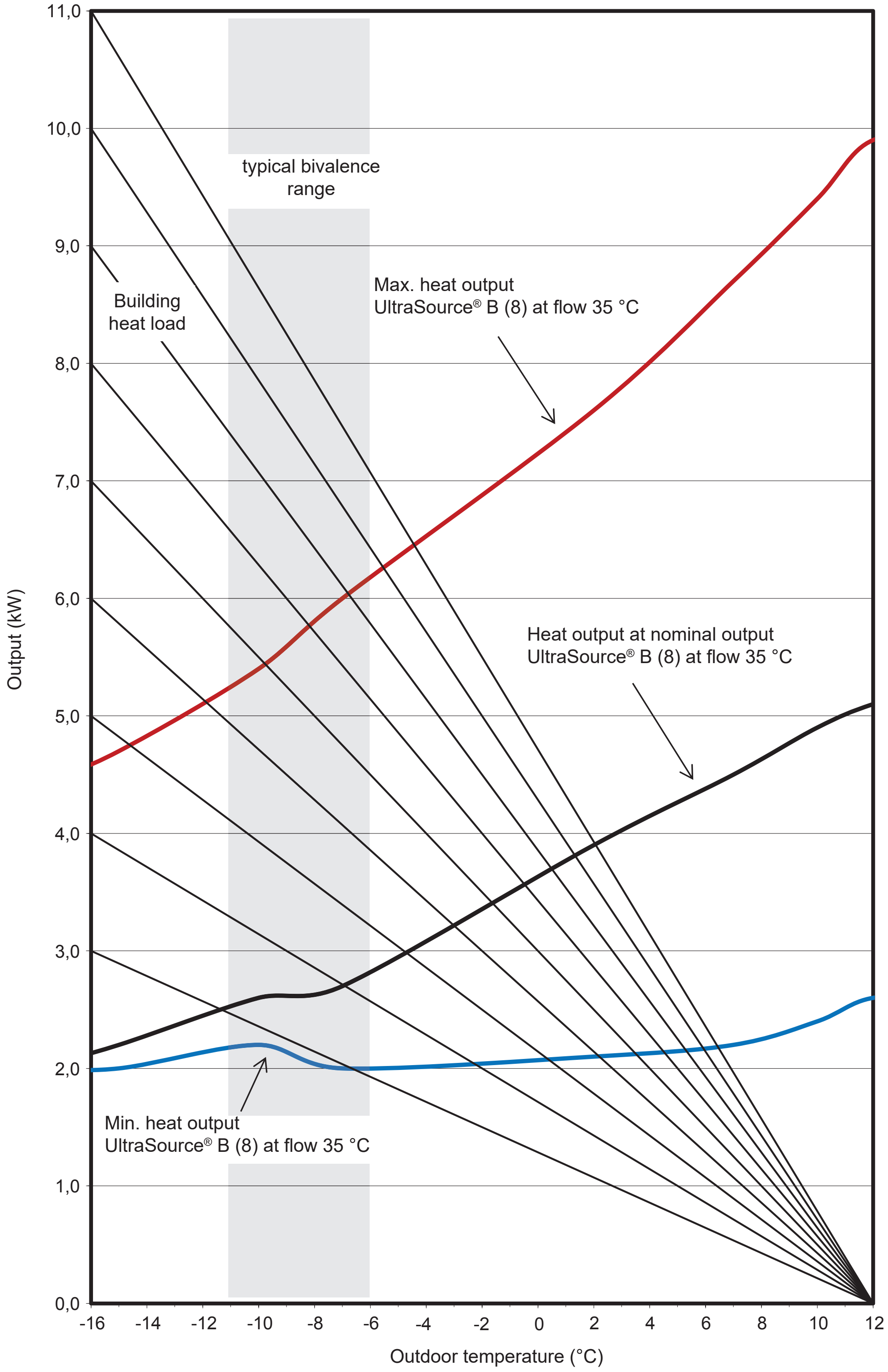


Dimensions of the UltraSource® B comfort C and UltraSource® B compact C air/water heat pumps with panel heating

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 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.



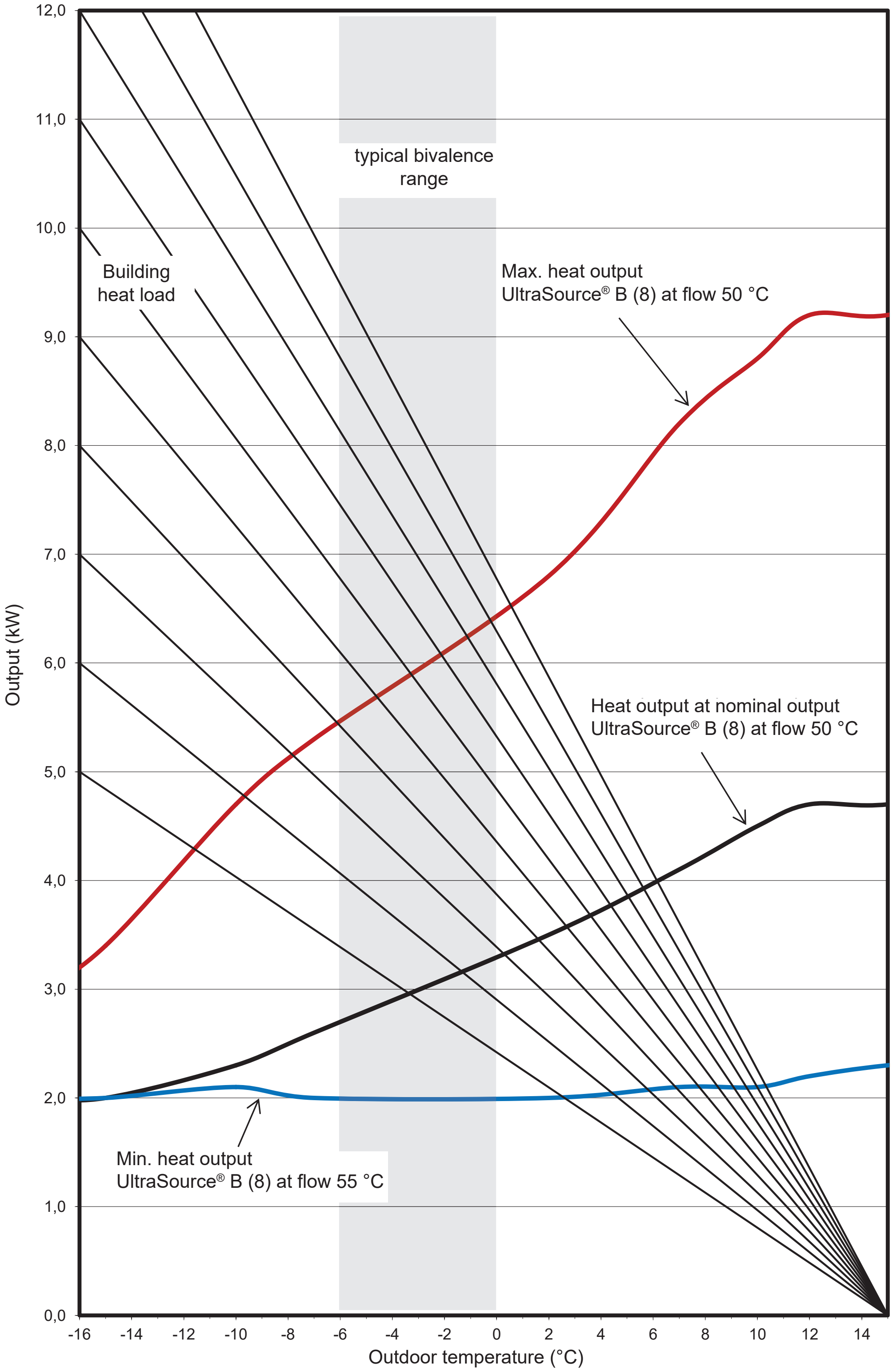
Dimensions of the UltraSource® B comfort C and UltraSource® B compact C air/water heat pumps with radiators

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.

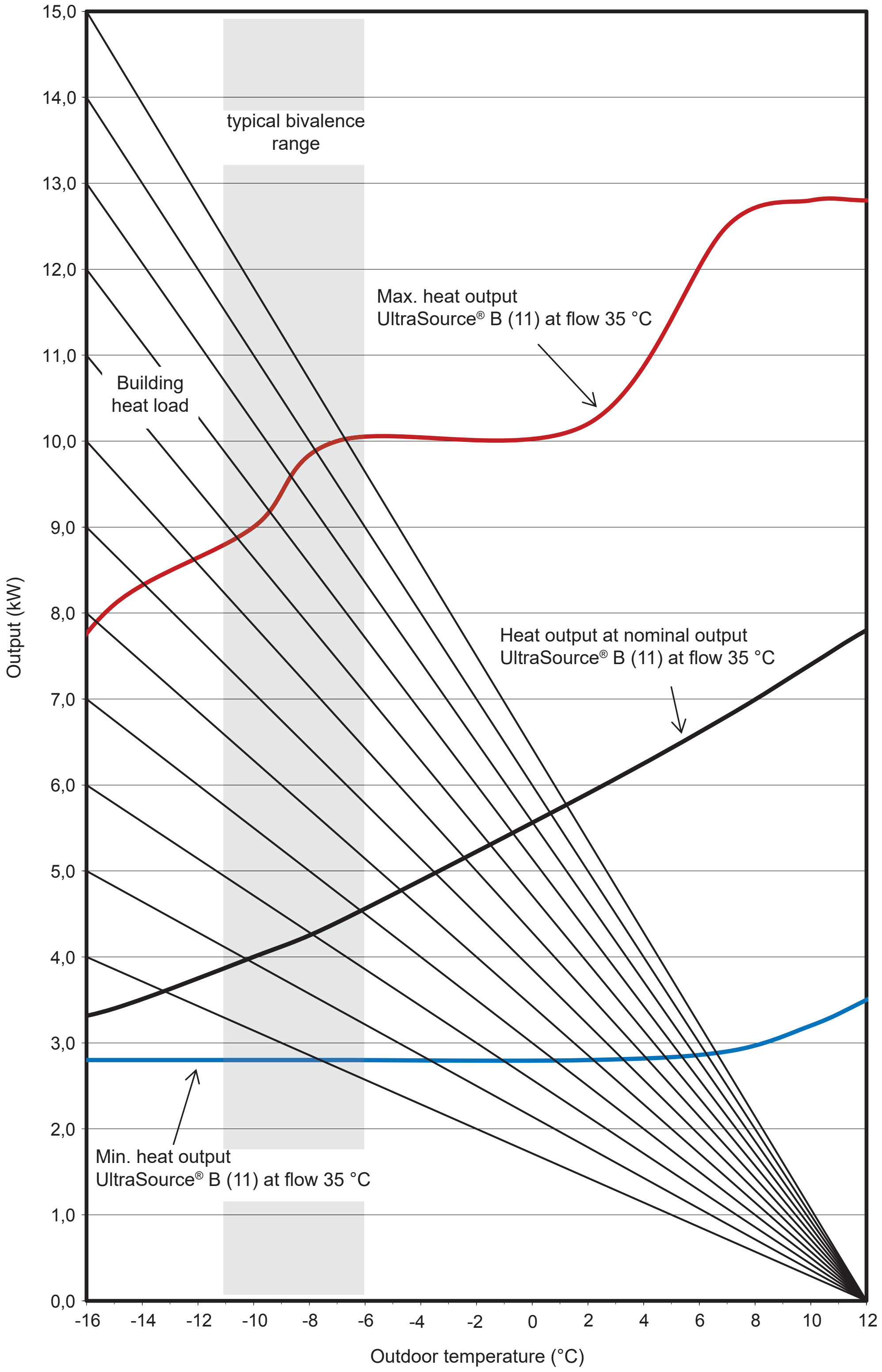


Dimensions of the UltraSource B comfort C and UltraSource® B compact C air/water heat pumps with panel heating

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 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.



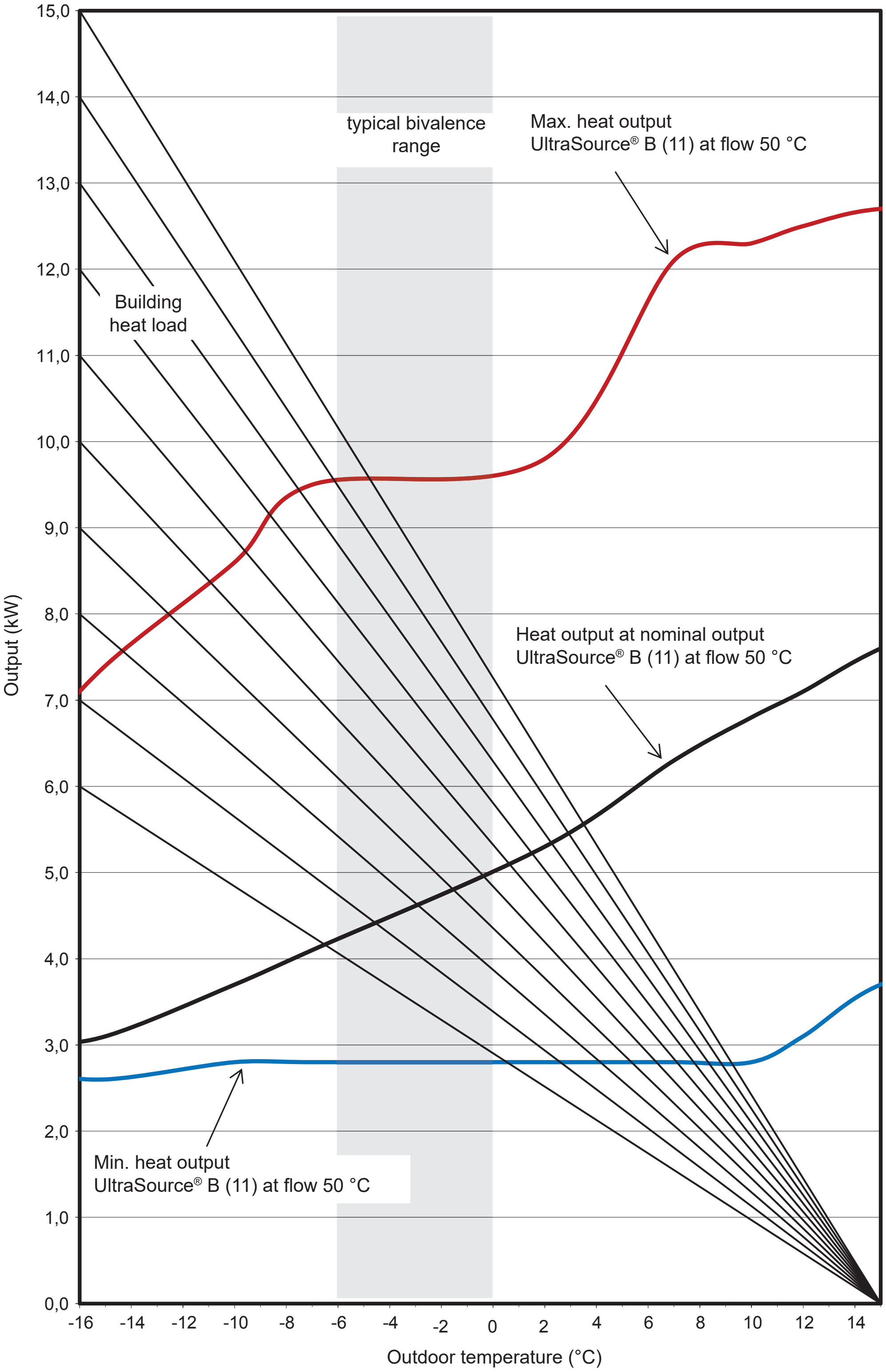
Dimensions of the UltraSource® B comfort C and UltraSource® B compact C air/water heat pumps with radiators

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.

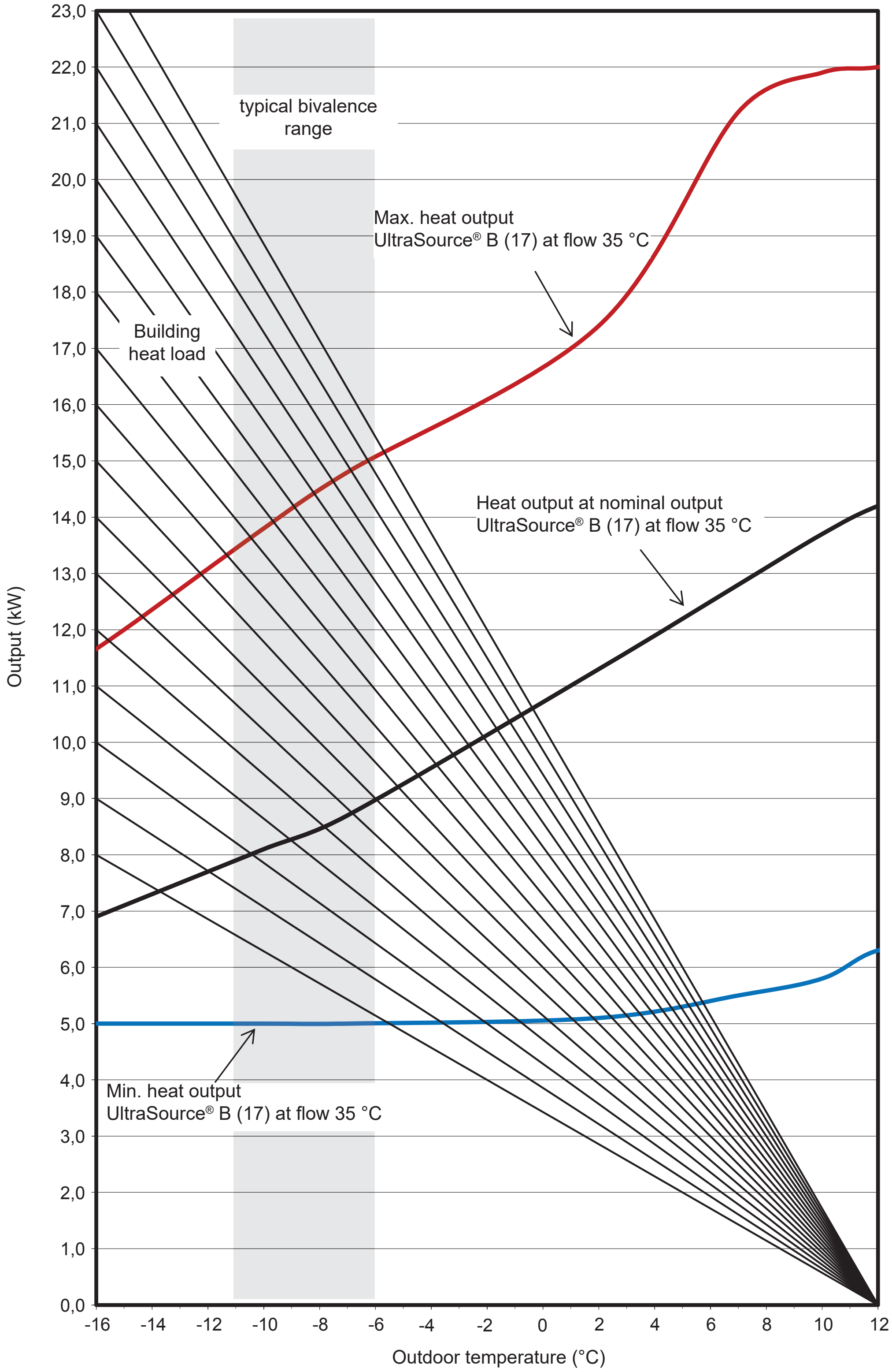


Dimensions of the UltraSource® B comfort C and UltraSource® B compact C air/water heat pumps with panel heating

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 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.



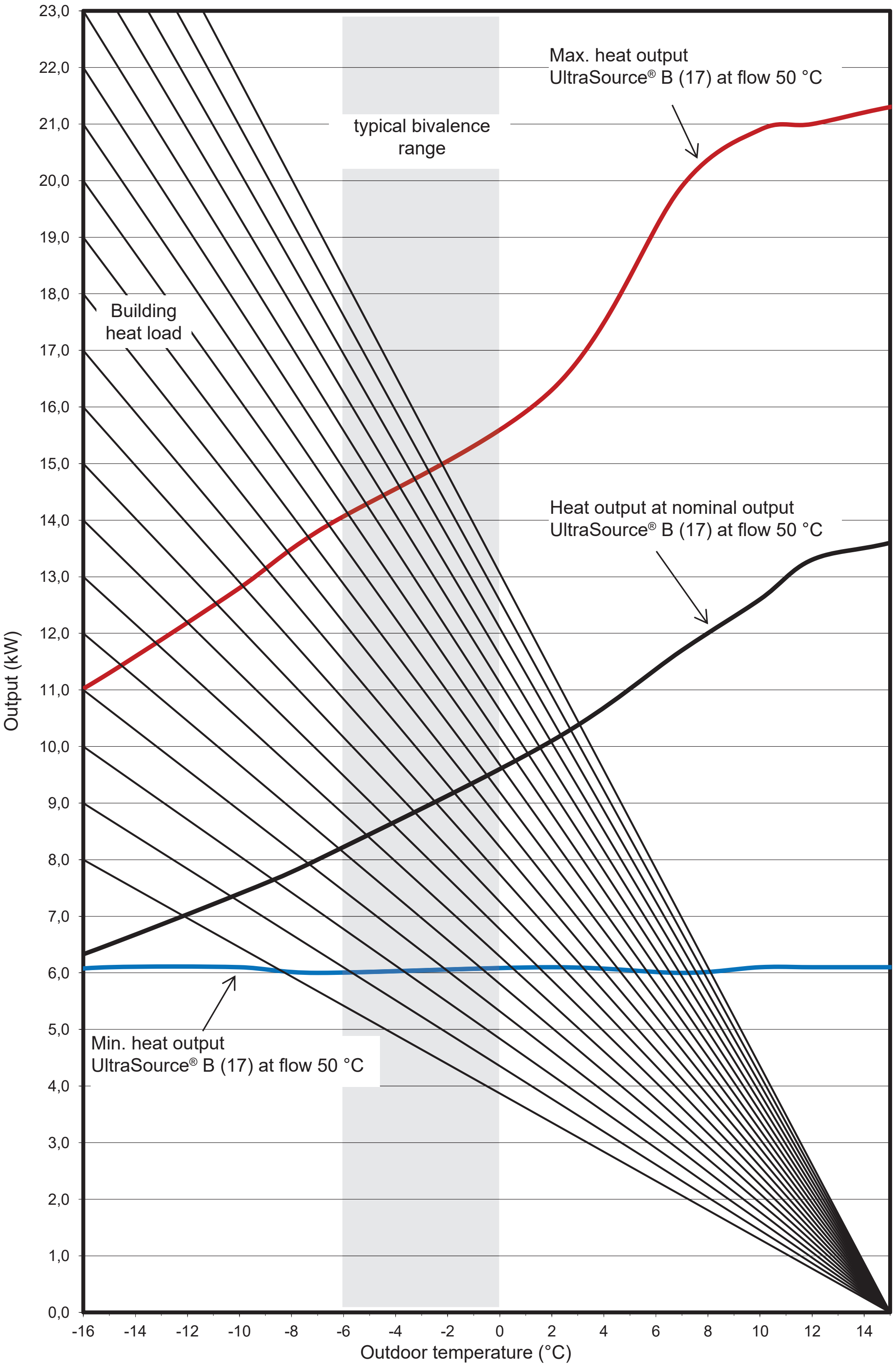
Dimensions of the UltraSource® B comfort C and UltraSource® B compact C air/water heat pumps with radiators

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.

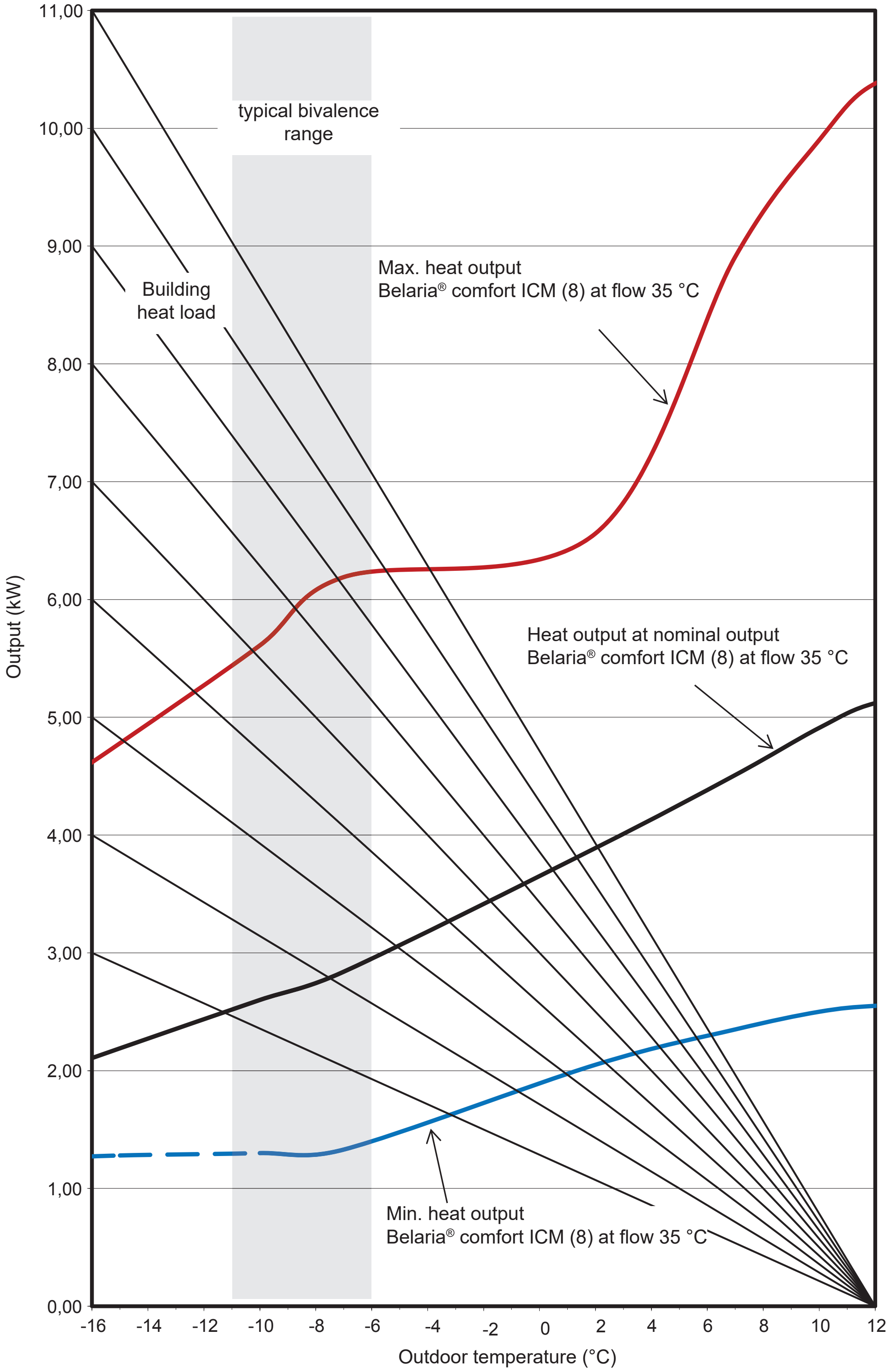


Dimensions of the Belaria® comfort ICM (8) air/water heat pumps with panel heating

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.



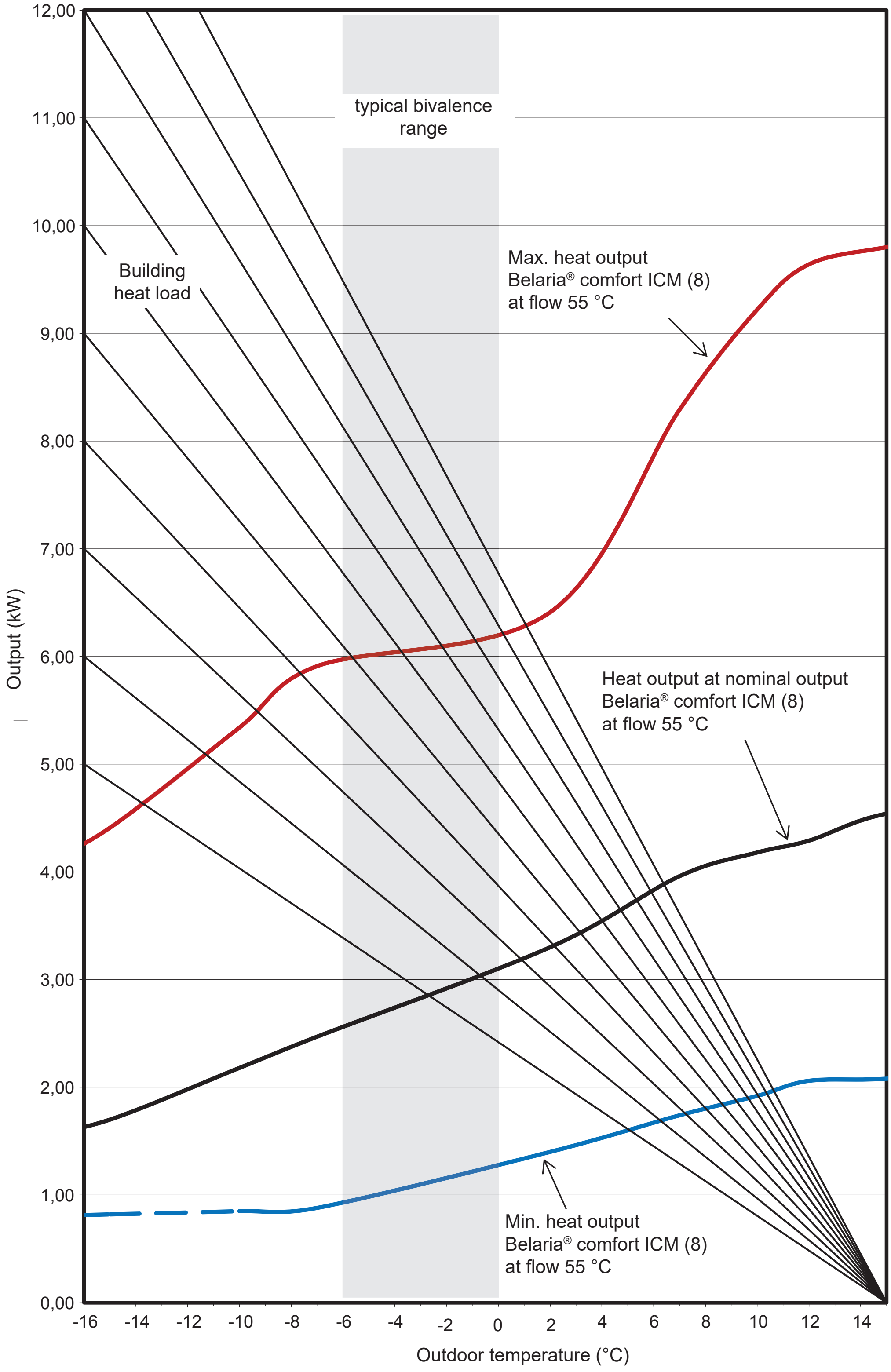
Dimensions of the Belaria® comfort ICM (8) air/water heat pumps with radiators

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.

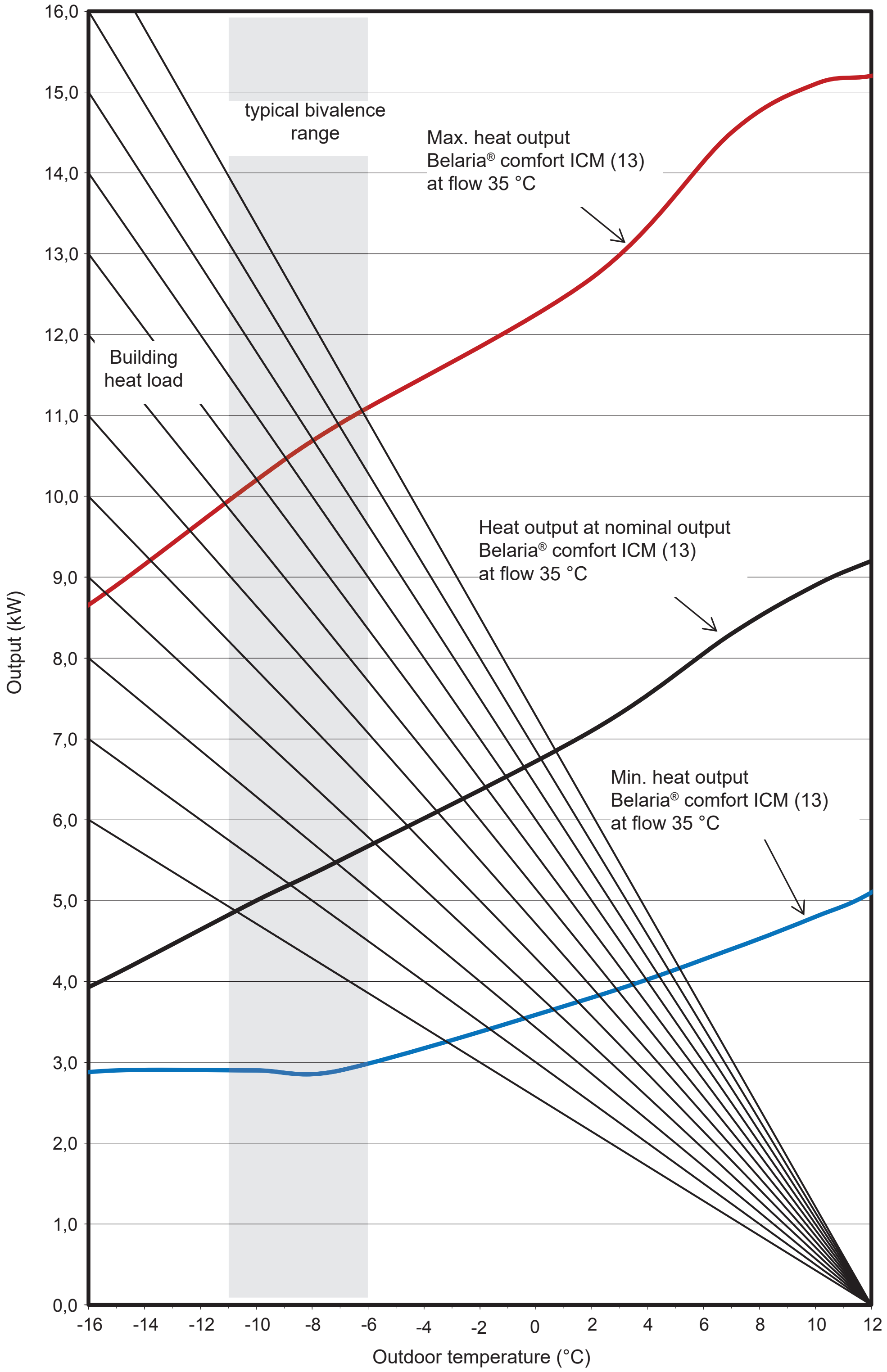


Dimensions of the Belaria® comfort ICM (13) air/water heat pumps with panel heating

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.



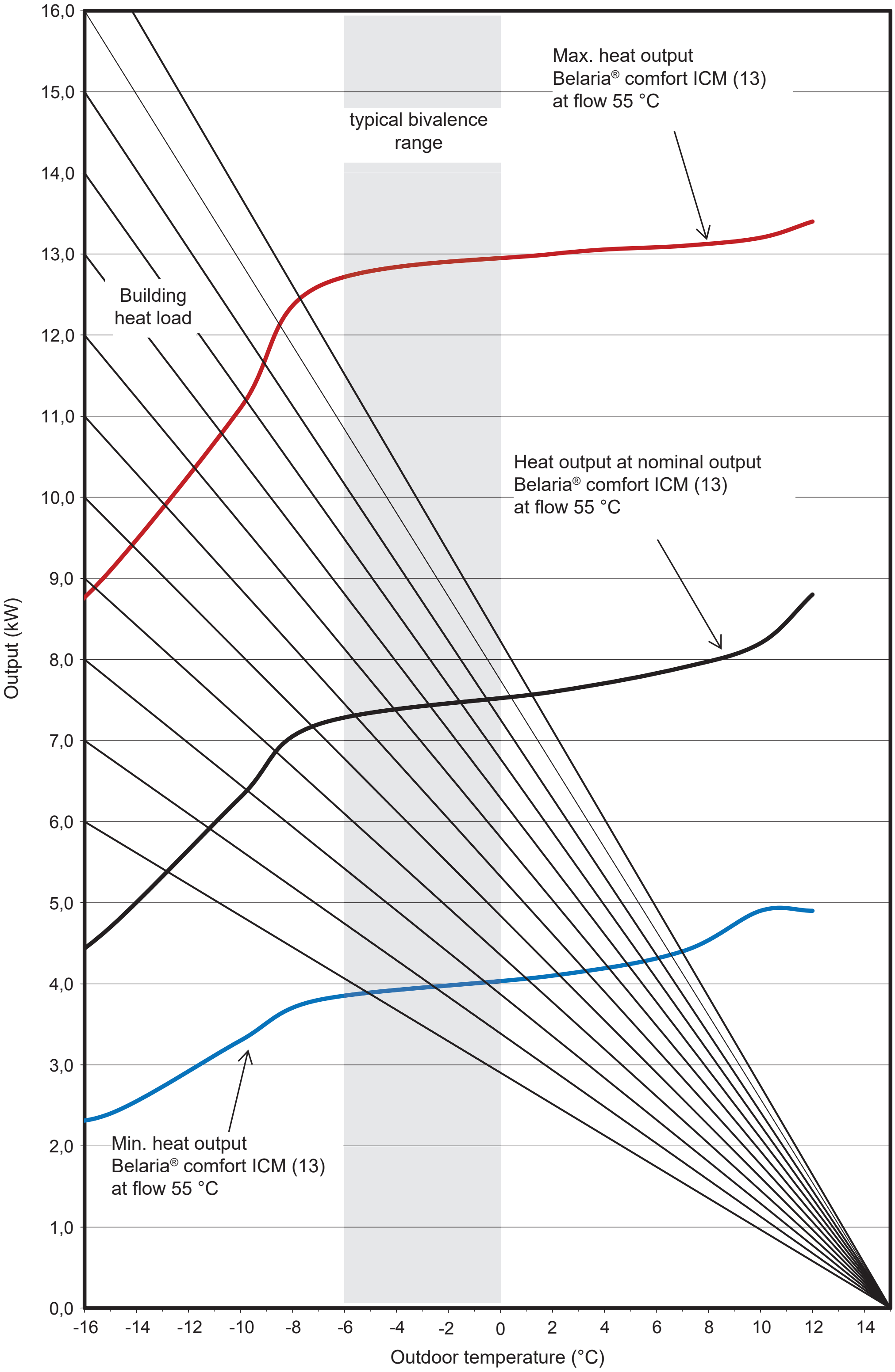
Dimensions of the Belaria® comfort ICM (13) air/water heat pumps with radiators

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.

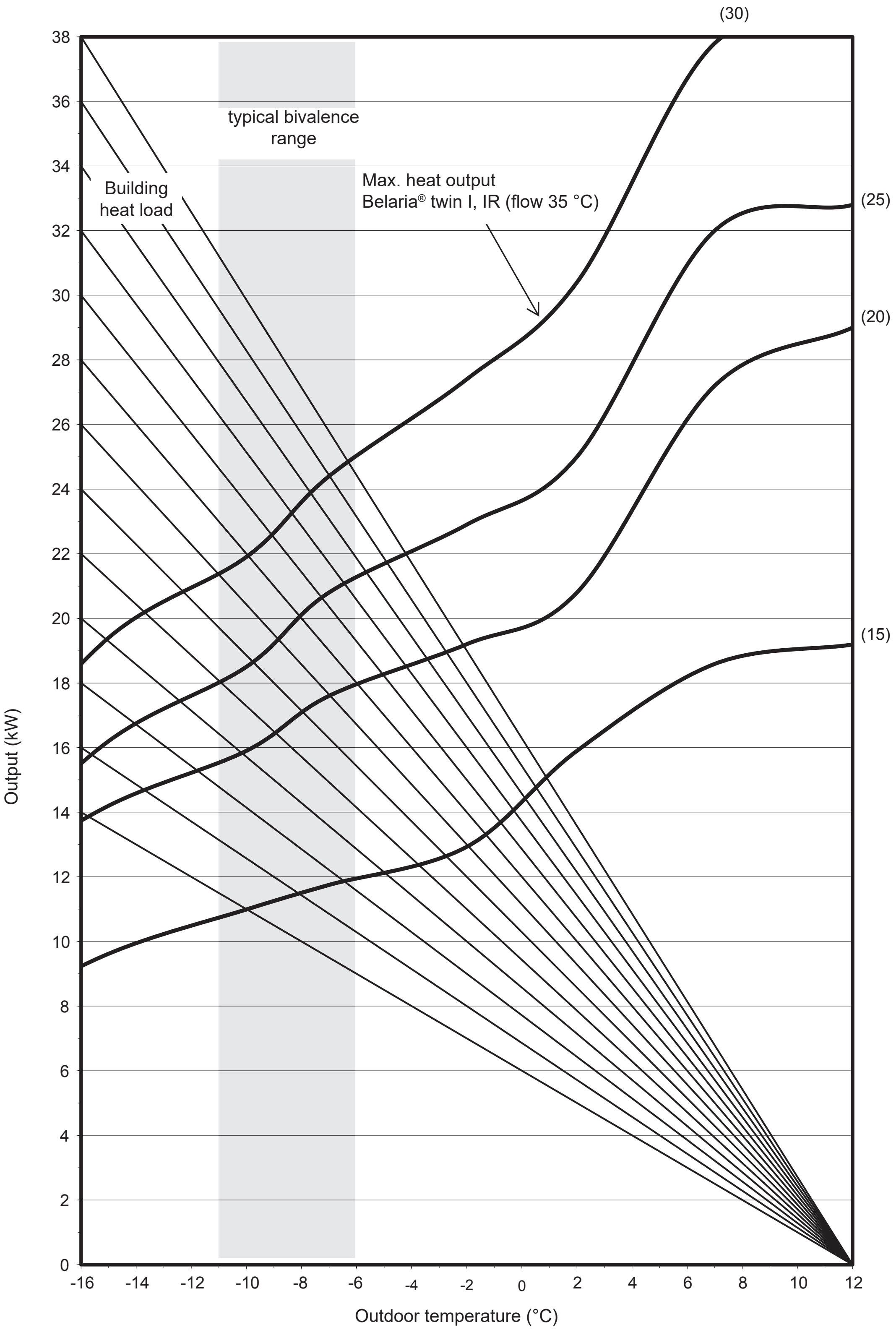


Dimensions of the Belaria® twin I, Belaria® twin IR air/water heat pump with panel heating

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.

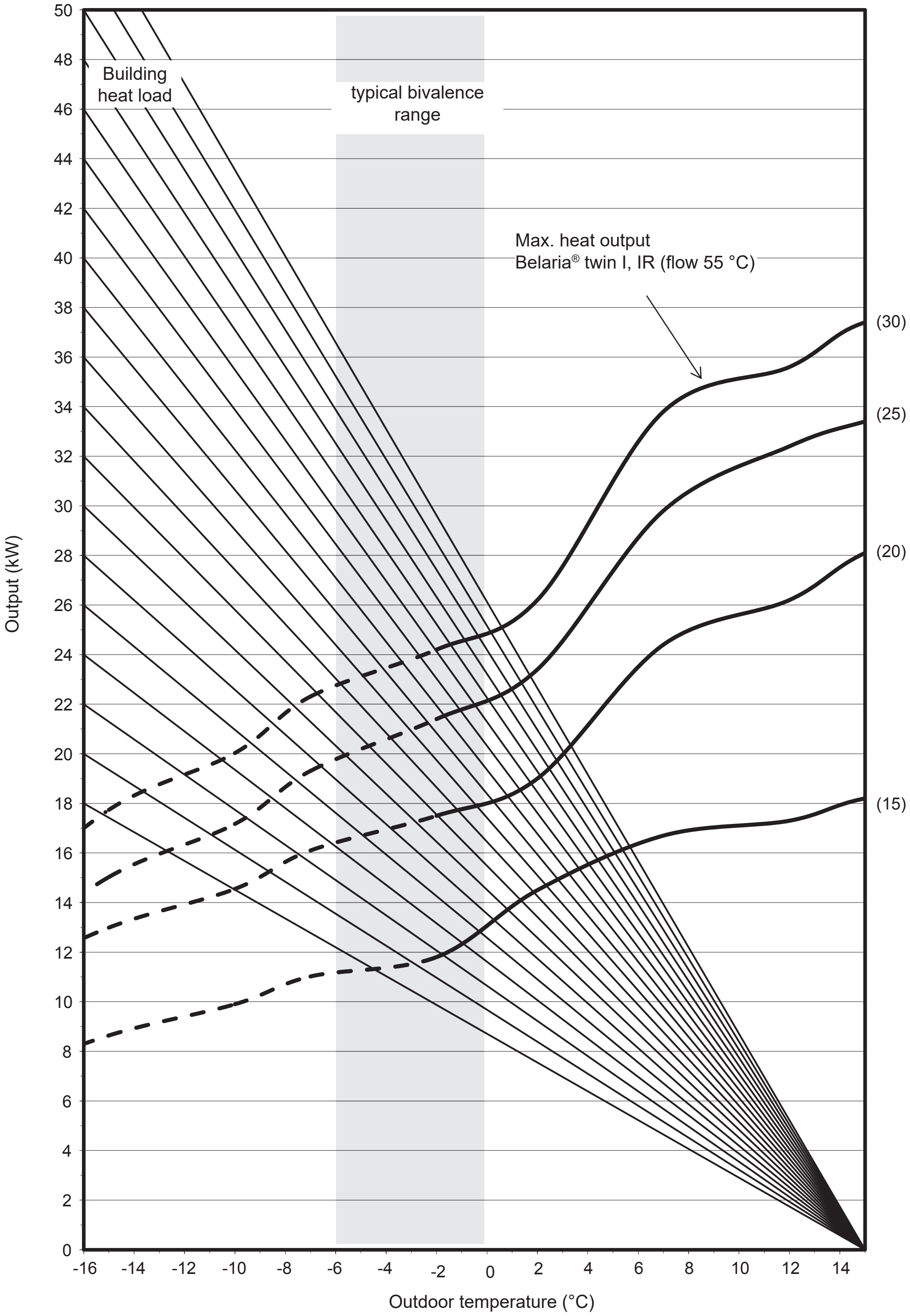
Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required 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.

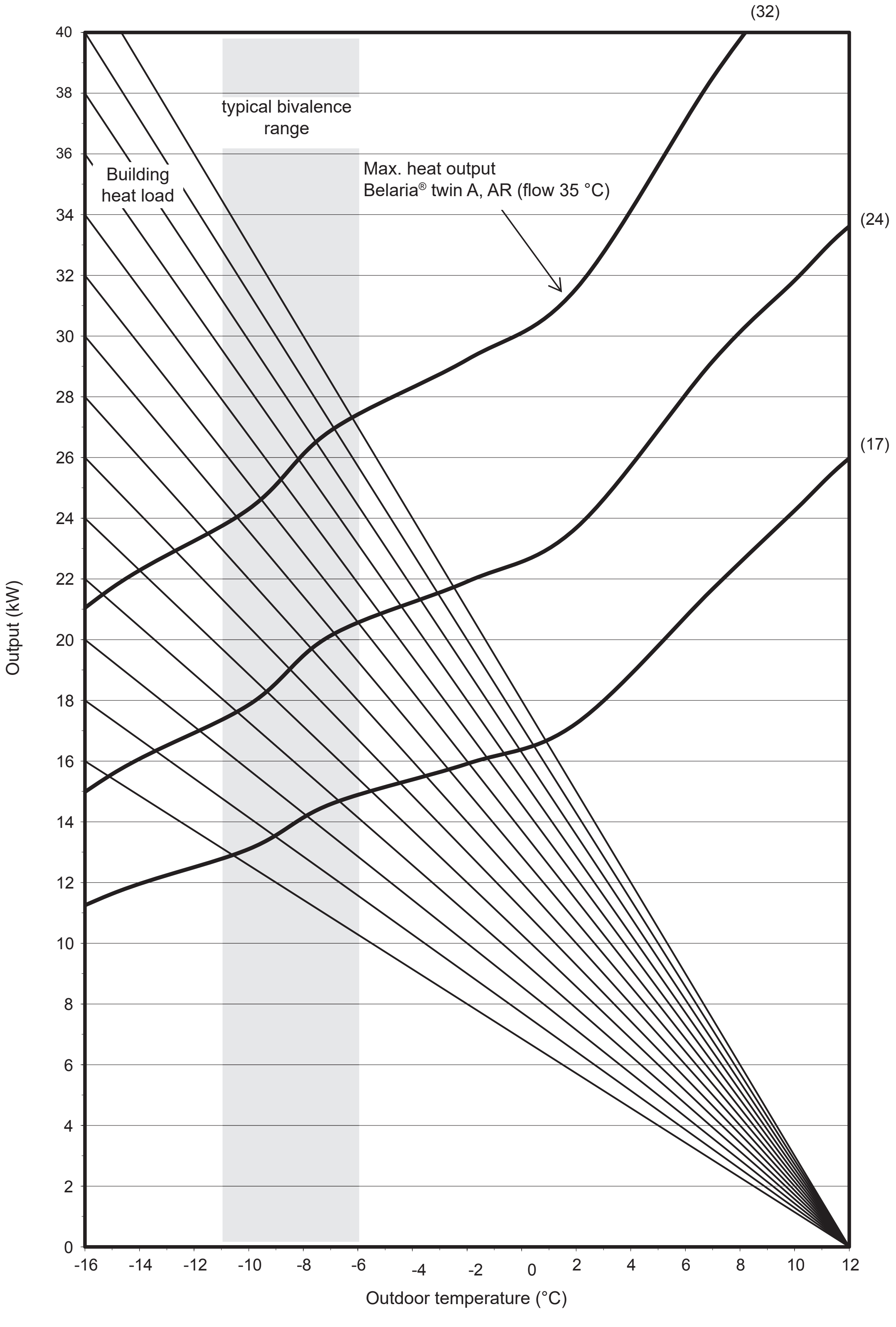


Dimensions of the Belaria® twin A, Belaria® twin AR air/water heat pump with panel heating

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.

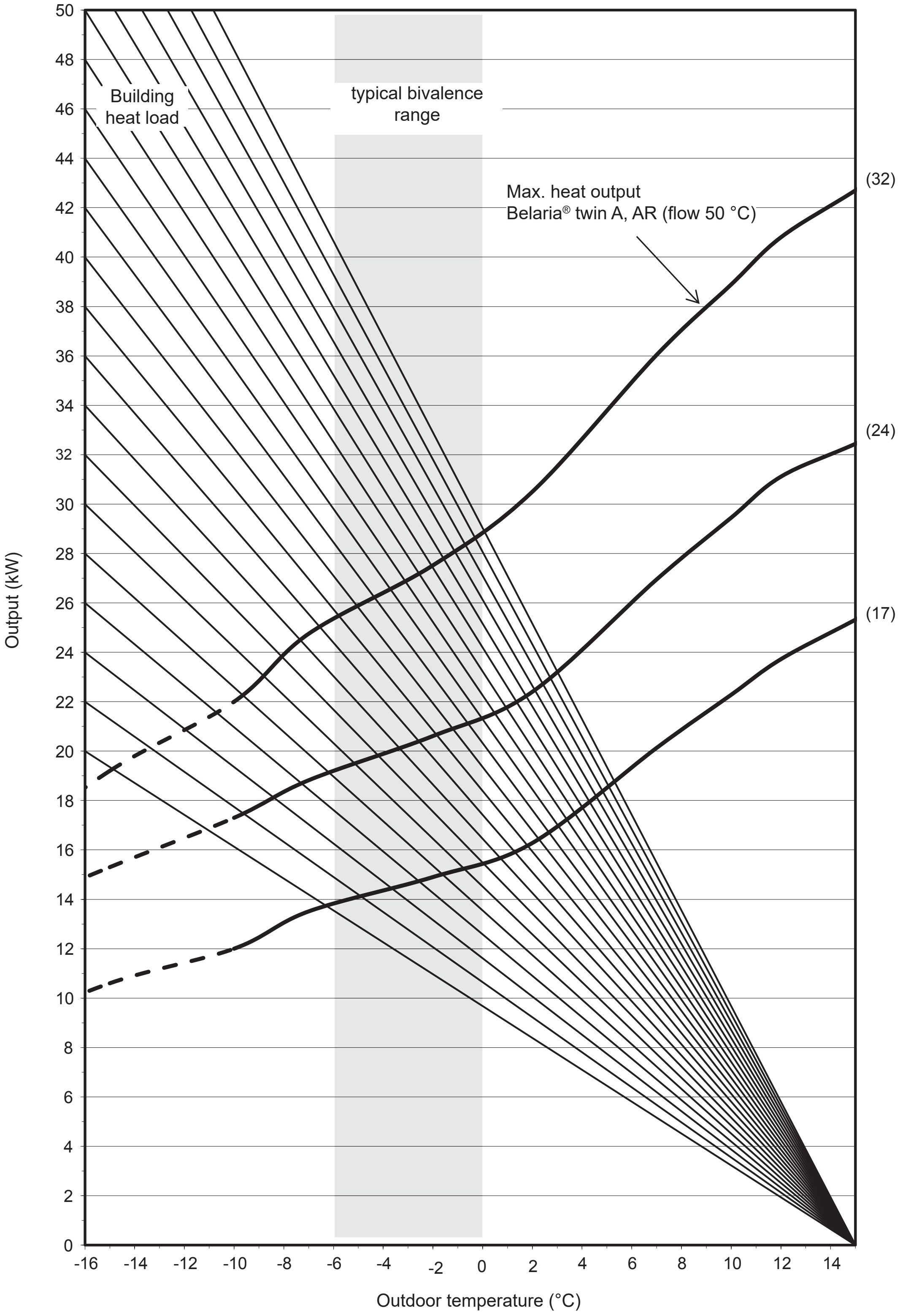
Ideally, at this standard outdoor temperature, the balance point should be within the grey shaded area between -6 °C and -11 °C outdoor temperature.
The further the balance point is displaced towards the left, the greater the contribution of the heat pump to the annual output and the smaller the required 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.

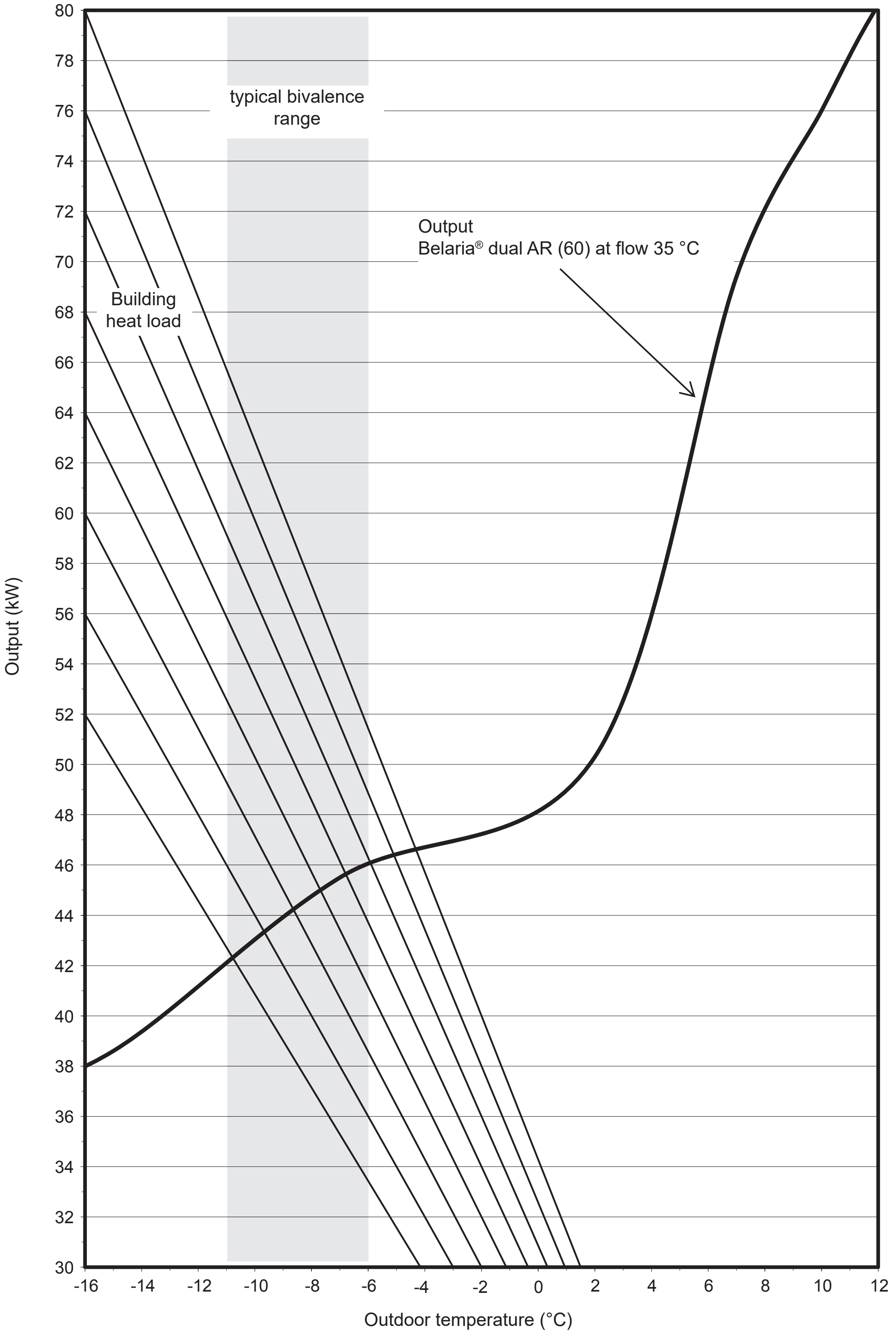


Dimensions of the Belaria® dual AR air/water heat pump with panel heating

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.

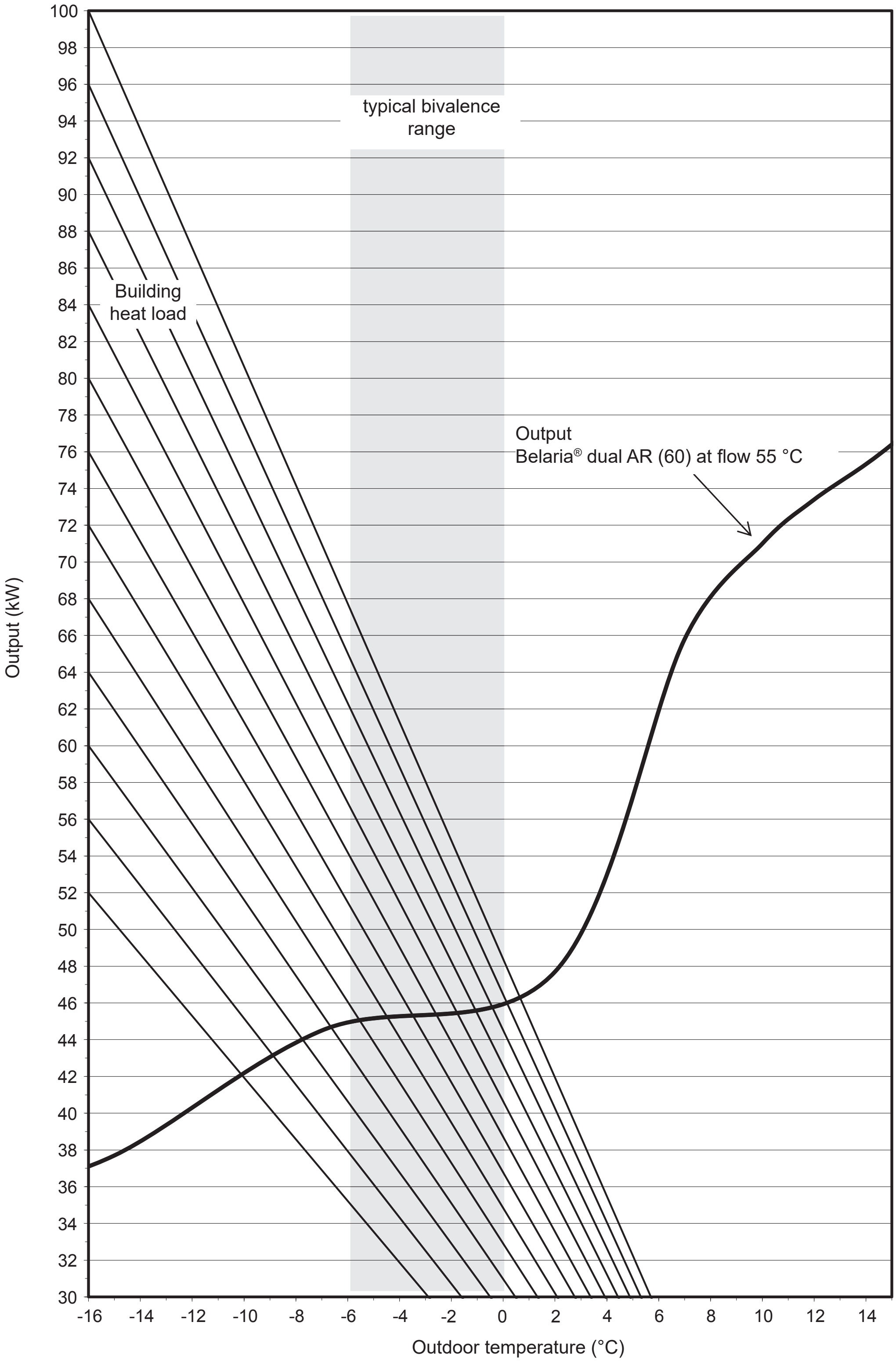


Dimensions of the Belaria® dual AR air/water heat pump with radiator

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 and water heating energy efficiency for air/water heat pumps				Room heating energy efficiency “moderate climate”		Water heating energy efficiency consumption profile/ηwh	
	Type	Symbol	Unit	35 °C	55 °C	35 °C	55 °C
Belaria® eco	(14)	ηS	%	180	142	-	
Belaria® eco	(16)	ηS	%	180	142	-	
Belaria® eco	(18)	ηS	%	180	142	-	
Belaria® eco compact	(14/230)	ηS	%	180	142	XL/107	
Belaria® eco compact	(16/230)	ηS	%	180	142	XL/107	
Belaria® eco compact	(18/230)	ηS	%	180	142	XL/107	
Belaria® pro comfort	(8)	ηS	%	206	153	-	
Belaria® pro comfort	(13)	ηS	%	202	154	-	
Belaria® pro compact	(8/100/270)	ηS	%	206	153	XL/-	
Belaria® pro compact	(13/100/270)	ηS	%	202	154	XL/-	
UltraSource® B comfort C	(8)	ηS	%	202	146	XL/95,8	
UltraSource® B compact C	(8/200)	ηS	%	202	146	XL/95,8	
UltraSource® B comfort C	(11)	ηS	%	176	135	-	
UltraSource® B compact C	(11/200)	ηS	%	176	135	XL/100	
UltraSource® B comfort C	(17)	ηS	%	206	152	XL/95,8	
Belaria® SRM	(4)	ηS	%	178	125	-	
Belaria® SRM	(6)	ηS	%	169	126	-	
Belaria® SRM	(8)	ηS	%	171	126	-	
Belaria® compact SRM	(4)	ηS	%	178	127	L/95	
Belaria® compact SRM	(6)	ηS	%	169	126	XL/90	
Belaria® compact SRM	(8)	ηS	%	171	126	XL/90	
Belaria® comfort ICM	(8)	ηS	%	181	130	-	
Belaria® comfort ICM	(13)	ηS	%	180	136	-	
Belaria® twin I	(15)	ηS	%	144	113	-	
Belaria® twin I	(20)	ηS	%	153	111	-	
Belaria® twin I	(25)	ηS	%	152	111	-	
Belaria® twin I	(30)	ηS	%	150	112	-	
Belaria® twin IR	(15)	ηS	%	145	114	-	
Belaria® twin IR	(20)	ηS	%	155	112	-	
Belaria® twin IR	(25)	ηS	%	153	112	-	
Belaria® twin IR	(30)	ηS	%	151	113	-	
Belaria® twin A	(17)	ηS	%	172	130	-	
Belaria® twin A	(24)	ηS	%	173	131	-	
Belaria® twin A	(32)	ηS	%	174	129	-	
Belaria® twin AR	(17)	ηS	%	177	133	-	
Belaria® twin AR	(24)	ηS	%	177	133	-	
Belaria® twin AR	(32)	ηS	%	177	131	-	
Belaria® dual AR	(60)	ηS	%	160	125	-	

Room heating and water heating energy efficiency for brine/water heat pumps				Room heating energy efficiency “moderate climate”		Water heating energy efficiency consumption profile/ηwh	
	Type	Symbol	Unit	35 °C	55 °C	35 °C	55 °C
UltraSource® T comfort	(8)	ηS	%	209	158	XL/100	
UltraSource® T compact	(8/200)	ηS	%	209	158	XL/100	
UltraSource® T comfort	(13)	ηS	%	213	162	-	
UltraSource® T compact	(13/200)	ηS	%	213	162	XL/106	
UltraSource® T comfort	(17)	ηS	%	226	164	XL/100	
Thermalia® comfort	(6)	ηS	%	166	120	-	
Thermalia® comfort	(8)	ηS	%	176	125	-	
Thermalia® comfort	(10)	ηS	%	191	133	-	
Thermalia® comfort	(13)	ηS	%	192	139	-	
Thermalia® comfort	(17)	ηS	%	190	140	-	
Thermalia® comfort H	(7)	ηS	%	179	134	-	
Thermalia® comfort H	(10)	ηS	%	188	140	-	
Thermalia® twin	(20)	ηS	%	202	138	-	
Thermalia® twin	(26)	ηS	%	198	138	-	
Thermalia® twin	(36)	ηS	%	206	148	-	
Thermalia® twin	(42)	ηS	%	203	135	-	
Thermalia® twin H	(13)	ηS	%	181	127	-	
Thermalia® twin H	(19)	ηS	%	175	132	-	
Thermalia® twin H	(22)	ηS	%	183	133	-	
Thermalia® dual	(55)	ηS	%	195	138	-	
Thermalia® dual	(70)	ηS	%	193	140	-	
Thermalia® dual	(85)	ηS	%	194	142	-	
Thermalia® dual	(110)	ηS	%	194	141	-	
Thermalia® dual	(140)	ηS	%	193	141	-	
Thermalia® dual H	(35)	ηS	%	177	130	-	
Thermalia® dual H	(50)	ηS	%	182	135	-	
Thermalia® dual H	(70)	ηS	%	182	132	-	
Thermalia® dual H	(90)	ηS	%	178	131	-	
Thermalia® dual R	(55)	ηS	%	195	138	-	
Thermalia® dual R	(70)	ηS	%	193	140	-	
Thermalia® dual R	(85)	ηS	%	194	142	-	
Thermalia® dual R	(110)	ηS	%	194	141	-	
Thermalia® dual R	(140)	ηS	%	193	141	-	

Room heating and water heating energy efficiency for water/water heat pumps				Room heating energy efficiency “moderate climate”		Water heating energy efficiency consumption profile/ηwh	
	Type	Symbol	Unit	35 °C	55 °C	35 °C	55 °C
UltraSource® T comfort	(8)	ηS	%	309	245	XL/100	
UltraSource® T compact	(8/200)	ηS	%	309	245	XL/100	
UltraSource® T comfort	(13)	ηS	%	313	217	-	
UltraSource® T compact	(13/200)	ηS	%	313	217	XL/115	
UltraSource® T comfort	(17)	ηS	%	311	226	XL/100	
Thermalia® comfort	(6)	ηS	%	205	150	-	
Thermalia® comfort	(8)	ηS	%	231	161	-	
Thermalia® comfort	(10)	ηS	%	245	170	-	
Thermalia® comfort	(13)	ηS	%	255	181	-	
Thermalia® comfort	(17)	ηS	%	240	173	-	
Thermalia® comfort H	(7)	ηS	%	238	177	-	
Thermalia® comfort H	(10)	ηS	%	249	185	-	
Thermalia® twin	(20)	ηS	%	277	183	-	
Thermalia® twin	(26)	ηS	%	274	180	-	
Thermalia® twin	(36)	ηS	%	270	191	-	
Thermalia® twin	(42)	ηS	%	259	176	-	
Thermalia® twin H	(13)	ηS	%	225	170	-	
Thermalia® twin H	(19)	ηS	%	226	172	-	
Thermalia® twin H	(22)	ηS	%	239	178	-	
Thermalia® dual	(55)	ηS	%	257	185	-	
Thermalia® dual	(70)	ηS	%	249	180	-	
Thermalia® dual	(85)	ηS	%	250	181	-	
Thermalia® dual	(110)	ηS	%	242	177	-	
Thermalia® dual	(140)	ηS	%	245	178	-	
Thermalia® dual H	(35)	ηS	%	254	179	-	
Thermalia® dual H	(50)	ηS	%	246	179	-	
Thermalia® dual H	(70)	ηS	%	245	177	-	
Thermalia® dual H	(90)	ηS	%	240	174	-	
Thermalia® dual R	(55)	ηS	%	257	185	-	
Thermalia® dual R	(70)	ηS	%	249	180	-	
Thermalia® dual R	(85)	ηS	%	250	181	-	
Thermalia® dual R	(110)	ηS	%	242	177	-	
Thermalia® dual R	(140)	ηS	%	245	178	-	

Belaria® air/water heat pumps

					Belaria® eco			Belaria® pro comfort		Belaria® SRM [1]			UltraSource® B comfort C [1]			Belaria® comfort ICM [2]		Belaria® twin I, twin IR				Belaria® twin A, twin AR			Belaria® dual AR
Heat generator type					(14)	(16)	(18)	(8)	(13)	(4)	(6)	(8)	(8)	(11)	(17)	(8)	(13)	(15)	(20)	(25)	(30)	(17)	(24)	(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															■	■	■		■	■	

[1] Heat output SRM 30 % modulated at A20W55
[1] Heat output UltraSource® B comfort C approx. 42 % modulated at A20W55
[2] Heat output Belaria® comfort ICM approx. 42 % modulated at A20W55

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:
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

					UltraSource® T comfort [1]			Thermalia® comfort, comfort H							Thermalia® twin, twin H							Thermalia® dual, dual H, dual R								
Heat generator type					(8)	(13)	(17)	(6)	(8)	(10)	(13)	(17)	H (7)	H (10)	(20)	(26)	(36)	(42)	H (13)	H (19)	H (22)	(55)	(70)	(85)	(110)	(140)	H (35)	H (50)	H (70)	H (90)
Material	Calorifier type			Heating surface [m^2]																										
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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■	■	■	

[1] Heat output UltraSource® T comfort approx. 42 % modulated at B0W55

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® water/water heat pumps

					UltraSource® T comfort [1]			Thermalia® comfort, comfort H							Thermalia® twin, twin H							Thermalia® dual, dual H, dual R								
Heat generator type					(8)	(13)	(17)	(6)	(8)	(10)	(13)	(17)	H (7)	H (10)	(20)	(26)	(36)	(42)	H (13)	H (19)	H (22)	(55)	(70)	(85)	(110)	(140)	H (35)	H (50)	H (70)	H (90)
Mate-rial	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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					■	■		

[1] Heat output UltraSource® T comfort approx. 42 % modulated at B0W55

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).

Flat collectors DA25, 120 m
Laying distance 0.5 m

			UltraSource® T comfort/compact (8)					UltraSource® T comfort/compact (13)						UltraSource® T comfort (17)				
Heat load (incl. hot water)		kW	3	4	5	6	7	8	9	10	11	12	13	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

			Thermalia® comfort						
Type			(6)	(8)	(10)	(13)	(17)	H (7)	H (10)
15 W/m²	Required area	m²	300	393	560	707	907	340	473
	Number of collector circuits	units	7	9	12	15	19	8	10
20 W/m²	Required area	m²	225	295	420	530	680	255	355
	Number of collector circuits	units	5	7	9	12	15	6	8
25 W/m²	Required area	m²	180	236	336	424	544	204	284
	Number of collector circuits	units	3	4	6	8	10	4	5
30 W/m²	Required area	m²	150	197	280	354	454	170	237
	Number of collector circuits	units	3	4	5	6	8	3	4
35 W/m²	Required area	m²	129	169	240	303	389	146	203
	Number of collector circuits	units	3	3	4	6	7	3	4

			Thermalia® twin						
Type			(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

			Thermalia® dual								
Type			(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 plate 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 plate 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 DA32, 200 m
Laying distance 0.65 m

			UltraSource® T comfort/compact (8)					UltraSource® T comfort/compact (13)						UltraSource® T comfort (17)				
Heat load (incl. hot water)		kW	3	4	5	6	7	8	9	10	11	12	13	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

			Thermalia® comfort						
Type			(6)	(8)	(10)	(13)	(17)	H (7)	H (10)
15 W/m²	Required area	m²	300	393	560	707	907	340	473
	Number of collector circuits	units	3	3	5	6	7	3	4
20 W/m²	Required area	m²	225	295	420	530	680	255	355
	Number of collector circuits	units	2	3	4	4	6	2	3
25 W/m²	Required area	m²	180	236	336	424	544	204	284
	Number of collector circuits	units	2	2	3	4	5	2	3
30 W/m²	Required area	m²	150	197	280	354	454	170	237
	Number of collector circuits	units	2	2	3	3	4	2	2
35 W/m²	Required area	m²	129	169	240	303	389	146	203
	Number of collector circuits	units	1	2	2	3	3	2	2

			Thermalia® twin						
Type			(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

			Thermalia® dual								
Type			(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 plate 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 plate 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.

			UltraSource® T comfort/compact (8)					UltraSource® T comfort/compact (13)						UltraSource® T comfort (17)				
Heat load (incl. hot water)		kW	3	4	5	6	7	8	9	10	11	12	13	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

			Thermalia®										
			comfort							twin			
Type			(6)	(8)	(10)	(13)	(17)	(7)	(10)	(20)	(26)	(36)	(42)
40 W/m	Total depth	m	113	148	210	265	339	128	178	405	518	705	830
	Frost protection	l	81	105	149	188	241	91	127	288	369	502	591
45 W/m	Total depth	m	101	132	187	236	301	114	158	360	460	627	738
	Frost protection	l	72	94	133	168	214	81	113	256	327	446	525
50 W/m	Total depth	m	91	118	168	212	271	102	142	324	414	564	664
	Frost protection	l	65	84	119	151	193	73	101	231	295	401	473
55 W/m	Total depth	m	83	108	153	193	247	93	130	295	377	513	604
	Frost protection	l	59	77	109	137	176	66	92	210	268	365	430
60 W/m	Total depth	m	76	99	140	177	226	85	119	270	345	470	554
	Frost protection	l	54	70	100	126	161	60	85	192	246	335	394

			Thermalia®											
			twin H			dual, dual R					dual H			
Type			(13)	(19)	(22)	(55)	(70)	(85)	(110)	(140)	(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 antifreeze concentration are calculated for duplex probes (4 x 32 x 2.9) and corresponds to 33 % Hoval antifreeze 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 plate 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 plate 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 of 120 m 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 antifreeze 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 less than 2 m are to be avoided.

3 Laying distance

In practice, routing is carried out with the following average distances:
Pipe DA25 = 0.5 m
Pipe DA32 = 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 Inserting 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 are to be laid in their entirety (do not shorten them!) and extended into the shaft and/or into the basement approx. 1m 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-antifreeze mixture with a frost protection of -15 °C (when using the Hoval antifreeze concentrate 33 vol %). 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.

8 Commissioning

Commissioning of the heat pump is carried out exclusively by Hoval customer service.
The heat pump must be electrically connected and the plant filled, well flushed and vented.
After commissioning, the customer receives a completion certificate.
As an option, an “inspection and system log book” can be obtained via Hoval customer service.

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 antifreeze 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 over the extended annual runtime (greater annual extraction).

3 Laying/drilling depth
The boreholes are made according to specification 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 Inserting 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-antifreeze mixture with a frost protection of -15 °C (when using the Hoval antifreeze concentrate 33 vol %). 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 PN10):

UltraSource® T (8), Thermalia® comfort (6-10),
comfort H (7,10): DA 40 (1¼″)
UltraSource® T (13,17),
Thermalia® comfort (13,17), twin H (13):
DA 50 (1½″)
Thermalia® twin (20,26), twin H (19,22):
DA 63 (2″)
Thermalia® twin (36-42), dual (55),
dual H (35,50), dual R (55): DA 75 (2½″)
Thermalia® dual (70,85), dual H (50-90),
dual R (70,85): DA 90 (3″)

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 plant filled, well flushed and vented.
After commissioning, the customer receives a completion certificate.
As an option, an “inspection and system log book” can be obtained via Hoval customer service.

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 recommended. 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 controllers 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 circuit must be executed in compliance with the Hoval circuit diagram. The intermediate circuit is filled with frost protection agent for frost protection of -15 °C (corresponds to 33 % Hoval antifreeze concentrate). The output of the heat pump can thus be read off for brine +5 °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 have to be met strictly during the entire period of operation of the heat pump (ground water analysis is imperative, as the water quality can change continually):

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 *
Manganese	< 0.1 mg/l *
Oxygen	< 2 mg/l*
Electric conductance	50 - 600 µS/cm

* 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. The operation of a water/water heat pump is therefore not advisable.

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 pipe 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 controller, a throttle valve is to be installed to adjust the volume flow. The connection pipes are also to be laid in a sand bed.

The following dimensions are recommended (material PE-HD PN10):

UltraSource® T (8), Thermalia® comfort (6-10), comfort H (7,10): DA 40 (1¼″)
UltraSource® T (13,17),
Thermalia® comfort (13,17), twin H (13): DA 50 (1½″)
Thermalia® twin (20,26), twin H (19,22): DA 63 (2″)
Thermalia® twin (36-42), dual (55), dual H (35,50), dual R (55): DA 75 (2½″)
Thermalia® dual (70,85), dual H (50-90), dual R (70,85): DA 90 (3″)

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

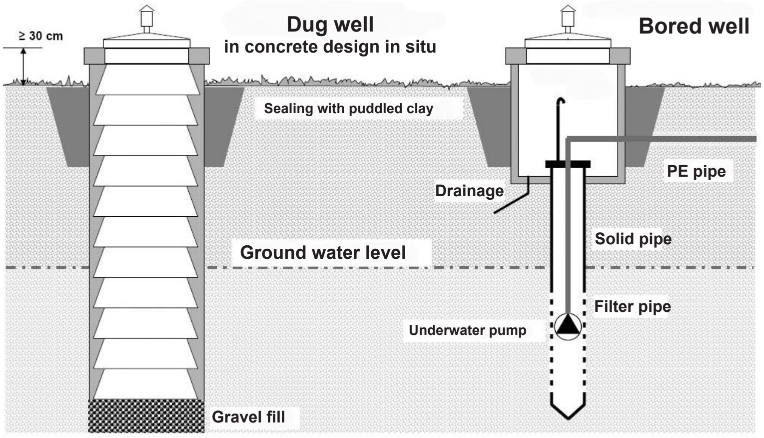
$$m_W = \frac{(P_K \text{ x } 3600)}{(c \text{ x } \Delta T)} \quad [\text{kg/h}]$$

m_W = mass flow [kg/h] (corresponds approx. to a water volume flow [l/h])
P_K = refrigerating capacity of the heat pump = heat output – electrical output [kW]
c = specific heat capacity [kJ/kg.K] (c_{water} = 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 valve 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 plant filled, well flushed and vented. After commissioning, the customer receives a completion certificate.
As an option, an “inspection and system log book” can be obtained via Hoval customer service.



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 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, partial cooling via underfloor heating or blower 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

- Recommended use with active and passive cooling
- In panel cooling, the surfaces enclosing the room (ceilings, floors or walls) are cooled by the following systems:
  - Underfloor 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
- Flow temperature monitoring is required so as to avoid condensation formation (dropping below the dewpoint) on cooling surfaces

Cooling by fan convectors

- Recommended use only with active cooling
- The cooling circuit must be equipped with a flow controller
- Fan convectors can cool and dehumidify the room air. This increases the comfort level.
- In fan convectors, cold water flows 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

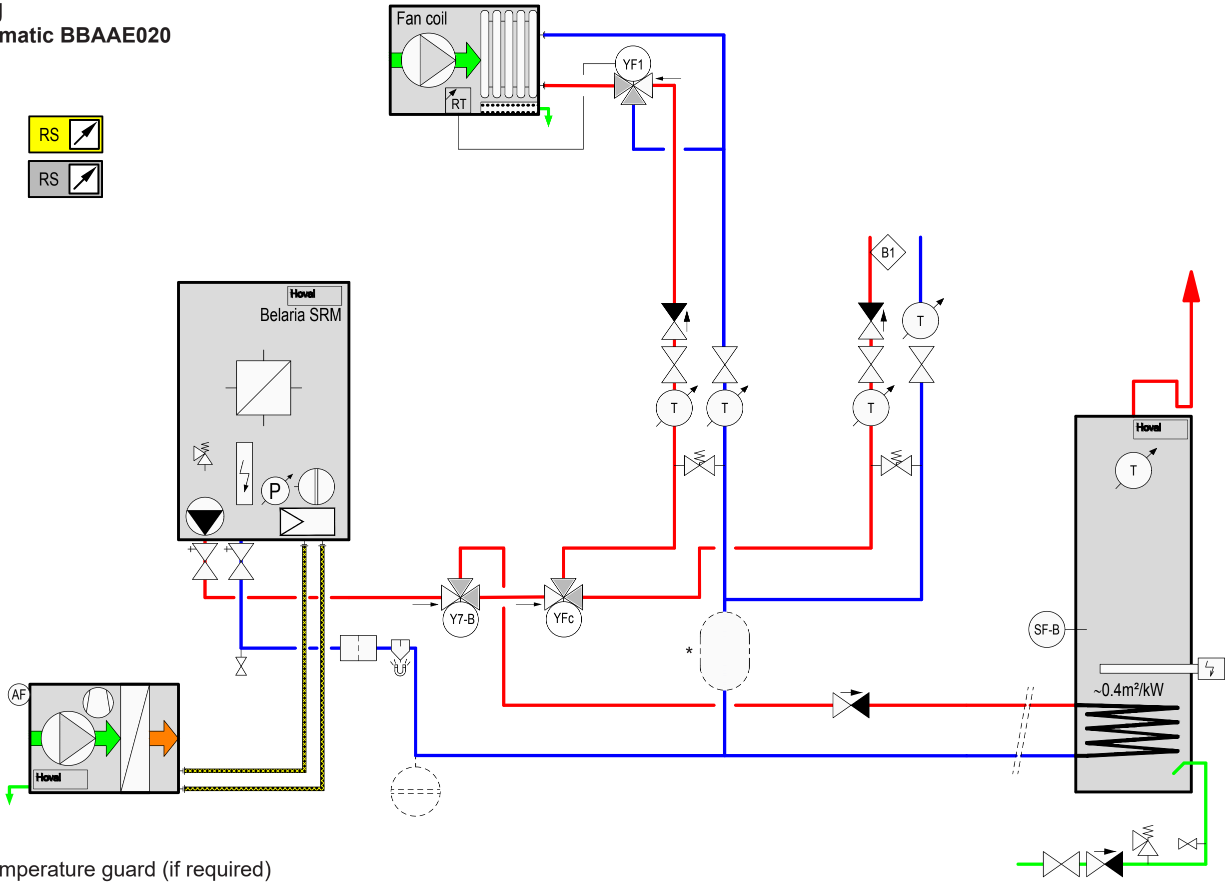
Pipe systems

- 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 BBAAE020



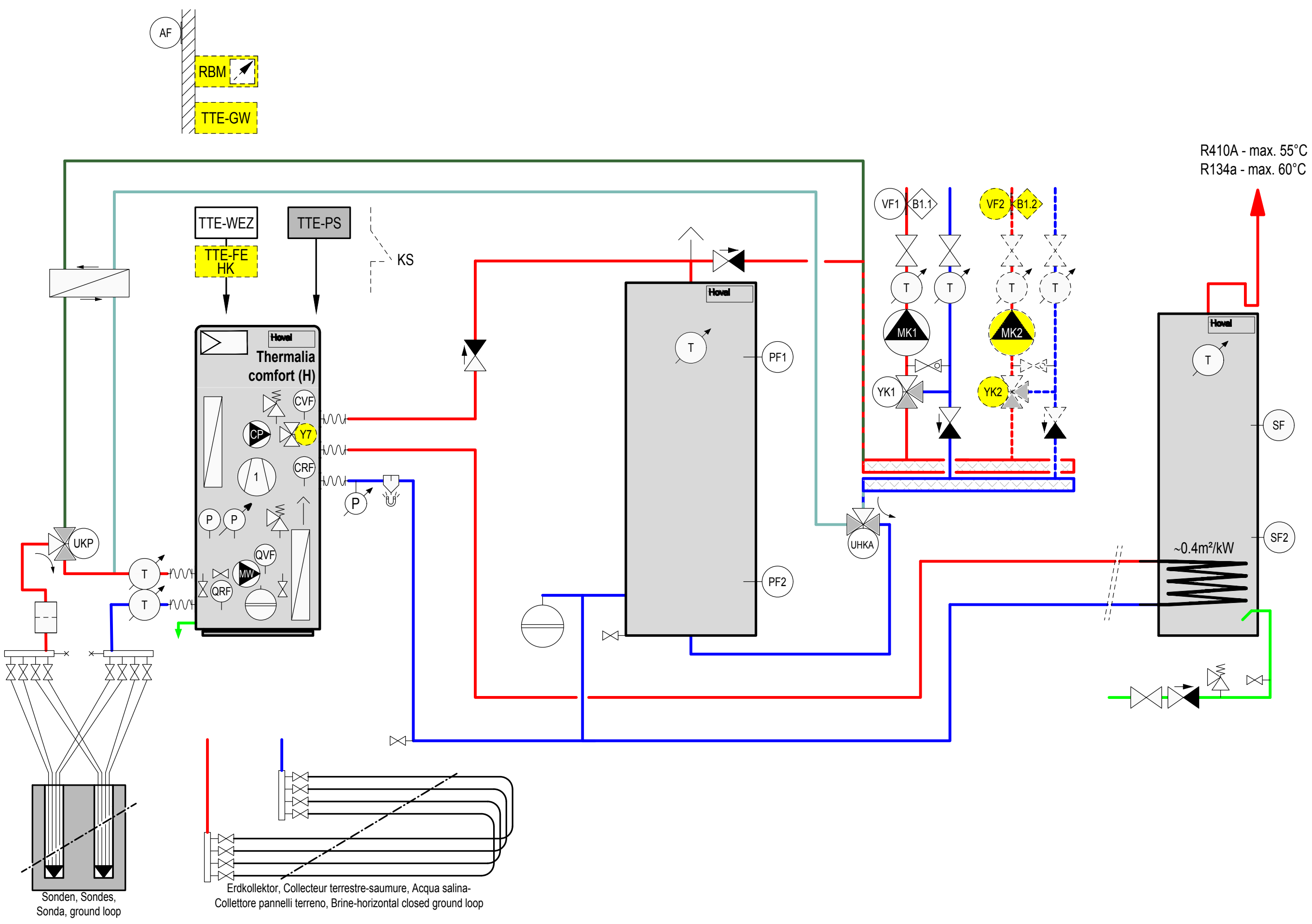
* Additional volume for defrosting procedure

B1	Flow temperature guard (if required)
AF	Outdoor sensor
YF1	Actuator Fan Coil
Y7-B	Switching valve (Belaria® SRM)
YFc	Switching valve (fan coil)
SF-B	Calorifier sensor

Option

BR	Burner connection
RT	External room/moisture thermostat

Passive cooling



TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-PS	TopTronic® E buffer module
VF1	Flow temperature sensor 1
B1.1	Flow temperature monitor (if required)
MK1	Pump, mixer circuit 1
YK1	Actuator, mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SF2	Calorifier sensor 2
PF1	Buffer sensor 1
PF2	Buffer sensor 2
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature monitor (if required)
MC2	Pump, mixer circuit 2
YK2	Actuator, mixer 2

Smart Grid (PV function)
Load management with heat pumps

Heat pumps are currently the most efficient method of storing electricity from volatile generation (green 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
- PV system/small wind turbine with Smart Grid-capable inverter or PV load manager (own electricity consumption)
- Heat pump
- TopTronic® E
- Energy buffer storage tank, min. 800 l
- Mixer circuit
- Possibly additional electrical heating

The heat pump is switched on and off or controlled according to demand, as in the past, depending on weather conditions. Moreover, it is switched on when a particular green electricity surplus is reached and charges the energy buffer storage tank and any calorifiers to a high, generally the maximum, temperature. At times when no green electricity (cheap electricity) is available any longer, the heating is supplied from the charged energy buffer storage tank. The heat pump needs to be operated less frequently during periods when electricity is expensive.

SG Ready standard:
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 is required for this. The information must be provided voltage-free.