VIESMANN

VITOCAL

Air/water heat pumps with indoor and outdoor units
Monoblock version, 2.4 to 14.7 kW

Technical guide

VITOCAL 200-A

Type AWO(-M) 201.A

Air/water heat pump with electric drive in monoblock design with outdoor and indoor unit
- For central heating and DHW heating in heating systems
- Indoor unit with Vitotronic 200 heat pump controller, high efficiency circulation pump for the secondary circuit, 3-way diverter valve and safety assembly

Type AWO(-M)-E 201.A

Equipment level as per type AWO(-M) 201.A, additionally with integral instantaneous heating water heater

Type AWO(-M)-E-AC 201.A

Equipment level as per type AWO(-M) 201.A, additionally with integral instantaneous heating water heater and active cooling function

VITOCAL 222-A

Type AWOT(-M)-E 221.A

Heat pump compact appliance with electric drive in monoblock design with outdoor and indoor unit
- For central heating and DHW heating in heating systems
- Indoor unit with Vitotronic 200 heat pump control unit, 220 l capacity integral DHW cylinder, high efficiency circulation pump for the secondary circuit, integral instantaneous heating water heater, 3-way diverter valve and safety assembly

Type AWOT(-M)-E-AC 221.A

Equipment level as per type AWOT(-M)-E 221.A, additionally with active cooling function

5831388 GB 5/2019

Index

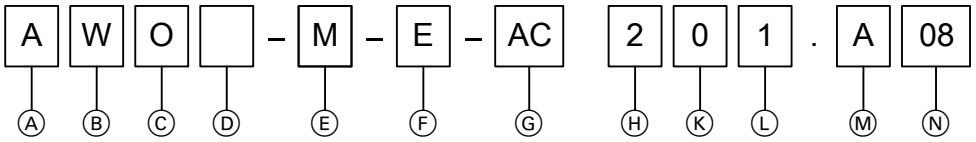
5831388

5831388

5831388

Product types designation

Vitocal 200-A, type



Pos.	Value	Meaning
Ⓐ	Medium, primary circuit	
	A	**A**ir
	B	**B**rine
	H	**H**ybrid
	W	**W**ater
Ⓑ	Medium, secondary circuit	
	W	**W**ater
Ⓒ	Model, part 1	
	B	Refrigerant circuit in split version (**Bi**-block)
	C	Circulation pumps and/or 3-way diverter valve installed (**C**ompact)
	H	High temperature version (**H**igh temperature)
	O	Outdoor installation (**O**utdoor)
	S	Heat pump, stage 2 without heat pump control unit (**S**lave)
	T	Heat pump compact appliance (**T**ower)
Ⓓ	Model, part 2	
	I	Indoor installation (**I**ndoor)
	T	Heat pump compact appliance (**T**ower)
Ⓔ	Power supply	
	M	230 V/50 Hz (**M**onophase)
	Not installed	400 V/50 Hz
Ⓕ	Electrical instantaneous heating water heater	
	E	Installed in the heat pump (built-in **E**lectric heating)
	Not installed	Not installed

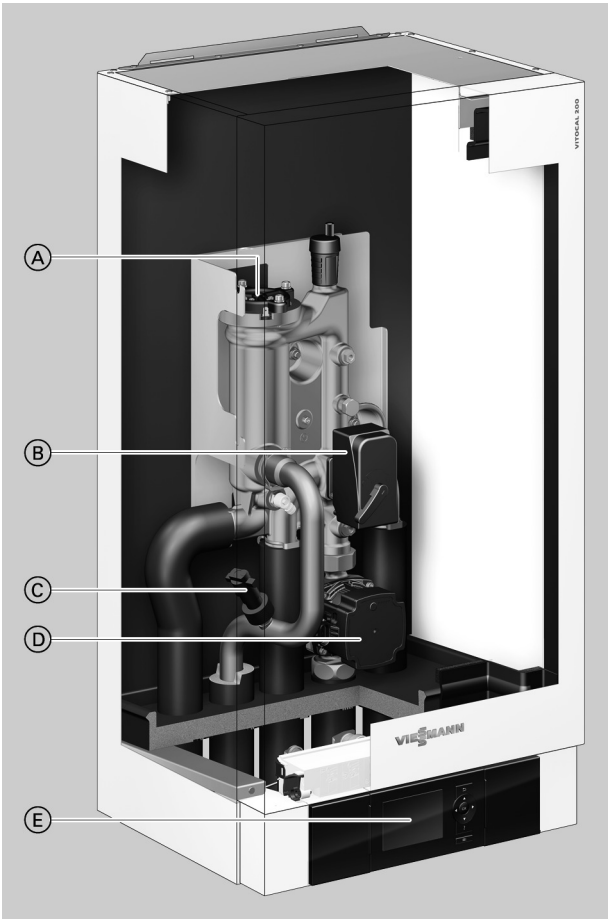
Pos.	Value	Meaning
Ⓖ	Cooling function	
	AC	"Active cooling"
	NC	"Natural cooling"
Ⓗ	Viessmann product segment	
	1	100
	2	200
	3	300
Ⓚ	DHW cylinder	
	0	Separate DHW cylinder required
	1/2/3	DHW cylinder installed, without solar utilisation
	4	DHW cylinder installed, with solar utilisation
Ⓛ	Heat pumps: Number of compressors in refrigerant circuit	
	1	1 compressor
	2	2 compressors (linked in parallel)
	Hybrid appliances: Number of heat sources	
	2	2 heat sources, e.g. 1 compressor and 1 burner
Ⓜ	**A** to ...	Product generation
Ⓝ	Output size (kW)	

▶▶

2.1 Product description

Benefits

Indoor unit



Ⓐ Instantaneous heating water heater (type AWO(-M)-E 201.A/ AWO(-M)-E-AC 201.A)
Ⓑ "Central heating/DHW heating" 3-way diverter valve
Ⓒ Flow switch
Ⓓ Secondary pump (high efficiency circulation pump)
Ⓔ Vitotronic 200 heat pump control unit

- Low running costs thanks to high COP (coefficient of performance) to EN 14511: Up to 5.0 (A7/W35)
- Output control and DC inverter for high efficiency in partial load operation
- Maximum flow temperature: Up to 60 °C at outside temperature of –10 °C
- Compact monoblock indoor unit with high efficiency circulation pump, 3-way diverter valve, safety assembly and control unit; types AWO(-M)-E 201.A and AWO(-M)-E-AC 201.A also with integral instantaneous heating water heater
- Easy to operate Vitotronic control unit with plain text and graphic display
- Convenient thanks to reversible system that enables heating and cooling.
- Optimised utilisation of power generated on-site by a photovoltaic system
- COP-optimised cascade function for up to 5 heat pumps
- Especially quiet operation thanks to Advanced Acoustic Design (AAD)
- Web-enabled through Vitoconnect (accessories) for operation and service via Viessmann apps

EHPA Quality Label

Heat pumps with KEYMARK certification

Delivered condition

Type AWO(-M) 201.A

Standard delivery:
- Complete heat pump in monoblock version, comprising an indoor and outdoor unit
- Indoor unit:
  - Integral "central heating/DHW heating" diverter valve
  - Integral high efficiency circulation pump for the secondary circuit
  - Integral safety valve and pressure gauge
  - Vitotronic 200 weather-compensated heat pump control unit with outside temperature sensor
  - Integral flow rate monitoring
  - Wall mounting bracket
- Outdoor unit:
  - Factory-filled with refrigerant R410A
  - Inverter-controlled compressor
  - Diverter valve
  - Electronic expansion valve
  - EC fan
  - Evaporator
  - Condenser

Type AWO(-M)-E 201.A
Equipment level as per type AWO(-M) 201.A

Additional equipment as part of the standard delivery:
- Instantaneous heating water heater, integrated into the indoor unit

Type AWO(-M)-E-AC 201.A
Equipment level as per type AWO(-M) 201.A

Additional equipment as part of the standard delivery:
- Instantaneous heating water heater, integrated into the indoor unit
- Active cooling function

Type overview

Type	Instantaneous heating water heater	Central cooling	Rated voltage	
			Indoor unit	Outdoor unit
AWO 201.A	—	—	230 V~	400 V~
AWO-M 201.A	—	—	230 V~	230 V~
AWO-E 201.A	X	—	230 V~	400 V~
AWO-M-E 201.A	X	—	230 V~	230 V~
AWO-E-AC 201.A	X	X	230 V~	400 V~
AWO-M-E-AC 201.A	X	X	230 V~	230 V~

2.2 Specification

Specification

230 V appliances

Type AWO-M/AWO-M-E/AWO-M-E-AC		**201.A04**	**201.A06**	**201.A08**	**201.A10**	**201.A13**	**201.A16**
Heating performance data to EN 14511 (A2/W35)							
Rated heating output	kW	2.61	3.11	4.04	5.01	5.92	6.47
Fan speed	rpm	600	600	650	600	600	600
Power consumption	kW	0.73	0.82	1.02	1.27	1.48	1.79
Coefficient of performance ε (COP) in heating mode		3.57	3.78	3.96	3.96	4.01	3.61
Output control	kW	2.00 to 4.10	2.40 to 5.50	2.80 to 7.00	4.40 to 9.60	4.80 to 10.20	5.20 to 10.70
Heating performance data to EN 14511 (A7/W35, 5 K spread)							
Rated heating output	kW	3.96	4.83	5.62	7.01	7.85	8.64
Fan speed	rpm	600	600	650	600	600	600
Air flow rate	m^3/h	2250	2250	2600	4500	4500	4500
Power consumption	kW	0.87	1.02	1.19	1.49	1.66	1.90
Coefficient of performance ε (COP) in heating mode		4.56	4.72	4.71	4.69	4.72	4.54
Output control	kW	2.44 to 4.18	3.00 to 6.00	3.47 to 7.54	5.48 to 12.60	6.00 to 13.70	6.42 to 14.30
Heating performance data to EN 14511 (A–7/W35)							
Rated heating output	kW	3.81	5.70	6.67	8.69	9.50	11.03
Power consumption	kW	1.31	1.96	2.31	2.77	3.09	3.90
Coefficient of performance ε (COP) in heating mode		2.91	2.91	2.89	3.14	3.07	2.83
Heating performance data to EN 14511 (A35/W7)							
Rated cooling capacity	kW	2.00	3.00	4.00	5.00	6.00	7.00
Fan speed	rpm	600	600	650	900	900	900
Power consumption	kW	0.80	1.20	1.40	1.90	2.30	2.70
Energy efficiency ratio EER in cooling mode		2.40	2.60	2.90	2.70	2.65	2.60
Output control	kW	Up to 3.90	Up to 4.90	Up to 6.20	Up to 8.00	Up to 9.00	Up to 10.30
Heating performance data to EN 14511 (A35/W18)							
Rated cooling capacity	kW	4.00	5.00	6.00	7.00	8.20	9.20
Fan speed	rpm	600	600	650	900	900	900
Power consumption	kW	0.80	1.35	1.40	1.67	2.08	2.42
Energy efficiency ratio EER in cooling mode		4.20	4.20	4.30	4.10	3.95	3.80
Output control	kW	Up to 5.00	Up to 6.00	Up to 7.00	Up to 11.00	Up to 12.50	Up to 13.90
Air intake temperature							
Cooling mode (type AWO-M-E-AC only)							
– Min.	°C	10	10	10	10	10	10
– Max.	°C	45	45	45	45	45	45
Heating mode							
– Min.	°C	–20	–20	–20	–20	–20	–20
– Max.	°C	35	35	35	35	35	35
Heating water (secondary circuit)							
Minimum flow rate	l/h	700	700	700	1400	1400	1400
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50	50	50	50	50	50
Max. external pressure drop (RFH) at	mbar	705	705	705	500	500	500
minimum flow rate	kPa	70.5	70.5	70.5	50	50	50
Max. flow temperature	°C	60	60	60	60	60	60
Outdoor unit electrical values							
Rated voltage, compressor		1/N/PE 230 V/50 Hz					
Max. operating current, compressor	A	13.0	14.6	14.6	19.9	23.3	23.3
Cos φ		0.99	0.99	0.99	0.99	0.99	0.99
Starting current, compressor	A	15	15	15	15	15	15
Fuse rating		B16 A	B16 A	B16 A	B25 A	B25 A	B25 A
IP rating		IP X4	IP X4	IP X4	IP X4	IP X4	IP X4

Vitocal 200-A (cont.)

Type AWO-M/AWO-M-E/AWO-M-E-AC		201.A04	201.A06	201.A08	201.A10	201.A13	201.A16
Indoor unit electrical values							
Heat pump control unit/PCB							
– Rated voltage, control unit/PCB				1/N/PE 230 V/50 Hz			
– Power supply fuse rating		1 x B16A	1 x B16 A	1 x B16 A	1 x B16 A	1 x B16 A	1 x B16 A
– Internal fuse				6.3 A (slow)/250 V			
Instantaneous heating water heater							
– Type AWO-M-E/AWO-M-E-AC: Factory-fitted							
– Type AWO-M: Accessories							
– Rated voltage				1/N/PE 230 V/50 Hz or 3/N/PE 400 V/50 Hz			
– Heating output	kW	9	9	9	9	9	9
– Power supply fuse rating		3 x B16A	3 x B16 A	3 x B16 A	3 x B16 A	3 x B16 A	3 x B16 A
Max. power consumption							
Fan	W	45	45	115	2 x 115	2 x 115	2 x 115
Outdoor unit	kW	2.85	3.20	3.30	4.55	5.08	5.08
Secondary pump (PWM)	W	60	60	60	60	60	60
– Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, outdoor unit	W	15	15	15	15	15	15
Control unit/PCB, indoor unit	W	10	10	10	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000	1000	1000	1000
Refrigerant circuit							
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A
– Refrigerant charge	kg	1.40	1.40	1.40	2.40	2.40	2.40
– Global warming potential (GWP)*1		1924	1924	1924	1924	1924	1924
– CO_2 equivalent	t	2.7	2.7	2.7	4.6	4.6	4.6
Compressor (hermetically sealed)	Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
– Oil in compressor	Type	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE
– Quantity of oil in compressor	l	0.76	0.76	0.76	1.17	1.17	1.17
Permissible operating pressure							
– High pressure side	bar	43	43	43	43	43	43
	MPa	4.3	4.3	4.3	4.3	4.3	4.3
– Low pressure side	bar	28	28	28	28	28	28
	MPa	2.8	2.8	2.8	2.8	2.8	2.8
Outdoor unit dimensions							
Total length	mm	546	546	546	546	546	546
Total width	mm	1109	1109	1109	1109	1109	1109
Total height	mm	753	753	753	1377	1377	1377
Indoor unit dimensions							
Total length	mm	370	370	370	370	370	370
Total width	mm	450	450	450	450	450	450
Total height	mm	880	880	880	880	880	880
Total weight							
Outdoor unit	kg	102	102	103	145	145	145
Indoor unit							
– Type AWO-M	kg	40	40	40	40	40	40
– Type AWO-M-E/AWO-M-E-AC	kg	41	41	41	41	41	41
Permissible operating pressure, secondary side	bar	3	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3	0.3
Connections (female thread)							
Heating water flow	G	1¼	1¼	1¼	1¼	1¼	1¼
Heating water return and DHW cylinder return	G	1¼	1¼	1¼	1¼	1¼	1¼
DHW cylinder flow	G	1¼	1¼	1¼	1¼	1¼	1¼
Secondary circuit flow	G	1¼	1¼	1¼	1¼	1¼	1¼
Secondary circuit return	G	1¼	1¼	1¼	1¼	1¼	1¼
Length of connection line between indoor and outdoor units (Hydraulic connection set)	m	1 to 20	1 to 20	1 to 20	1 to 20	1 to 20	1 to 20
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/ EN ISO 9614-2)							
Weighted total sound power level							
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ (max.)	dB(A)	56	56	58	60	61	61
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ in night mode	dB(A)	50	50	50	55	55	55

*1 *Based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

5831388

Type AWO-M/AWO-M-E/AWO-M-E-AC		201.A04	201.A06	201.A08	201.A10	201.A13	201.A16
Energy efficiency class to EU Regulation no. 813/2013							
Heating, average climatic conditions							
– Low temperature applications (W35)		A^{++}	A^{++}	A^{+++*2}	A^{+++*2}	A^{+++*2}	A^{+++*2}
– Medium temperature applications (W55)		A^{+}	A^{++}	A^{++}	A^{++}	A^{++}	A^{++}
Performance data as per EU Regulation no. 813/2013 (average climatic conditions)							
Low temperature applications (W35)							
– Energy efficiency η_S	%	173	172	175	176	175	175
– Rated heating output P_{rated}	kW	5.38	5.59	6.82	9.32	9.99	10.61
– Seasonal coefficient of performance (SCOP)		4.40	4.38	4.46	4.47	4.46	4.46
Medium temperature applications (W55)							
– Energy efficiency η_S	%	124	125	127	129	130	130
– Rated heating output P_{rated}	kW	5.23	5.59	6.41	9.35	10.07	10.72
– Seasonal coefficient of performance (SCOP)		3.18	3.21	3.25	3.29	3.32	3.34
Sound power level to ErP							
Sound power level, outdoor unit	dB(A)	53	54	55	56	56	56

Note

Reduced noise night mode can be enabled at the heat pump control unit at the "Contractor" setting level.

400 V appliances

Type AWO/AWO-E/AWO-E-AC		201.A10	201.A13	201.A16
Heating performance data to EN 14511 (A2/W35)				
Rated heating output	kW	6.10	6.67	7.02
Fan speed	rpm	600	600	600
Power consumption	kW	1.49	1.64	1.78
Coefficient of performance ε (COP) in heating mode		4.10	4.06	3.94
Output control	kW	4.40 to 10.10	4.80 to 10.70	5.20 to 11.20
Heating performance data to EN 14511 (A7/W35, 5 K spread)				
Rated heating output	kW	7.58	8.88	10.11
Fan speed	rpm	600	600	600
Air flow rate	m^3/h	4500	4500	4500
Power consumption	kW	1.51	1.78	2.04
Coefficient of performance ε (COP) in heating mode		5.01	4.99	4.95
Output control	kW	5.45 to 13.60	5.93 to 14.20	6.40 to 14.70
Heating performance data to EN 14511 (A–7/W35)				
Rated heating output	kW	10.09	11.06	11.60
Power consumption	kW	3.17	3.60	3.87
Coefficient of performance ε (COP) in heating mode		3.18	3.07	3.00
Heating performance data to EN 14511 (A35/W7)				
Rated cooling capacity	kW	5.00	6.00	7.00
Fan speed	rpm	600	600	600
Power consumption	kW	1.90	2.30	2.80
Energy efficiency ratio EER in cooling mode		2.70	2.60	2.50
Output control	kW	Up to 8.00	Up to 9.00	Up to 10.00
Heating performance data to EN 14511 (A35/W18)				
Rated cooling capacity	kW	7.00	8.20	9.20
Fan speed	rpm	600	600	600
Power consumption	kW	1.71	2.00	2.30
Energy efficiency ratio EER in cooling mode		4.10	4.10	4.00
Output control	kW	Up to 8.00	Up to 9.00	Up to 10.00
Air intake temperature				
Cooling mode (type AWO-E-AC only)				
– Min.	°C	10	10	10
– Max.	°C	45	45	45
Heating mode				
– Min.	°C	–20	–20	–20
– Max.	°C	35	35	35

**2 The new energy efficiency class A^{+++} comes into effect on 26 September 2019.*

Type AWO/AWO-E/AWO-E-AC		201.A10	201.A13	201.A16
Heating water (secondary circuit)				
Minimum flow rate	l/h	1400	1400	1400
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50	50	50
Max. external pressure drop (RFH) at minimum flow rate	mbar	500	500	500
	kPa	50	50	50
Max. flow temperature	°C	60	60	60
Outdoor unit electrical values				
Rated voltage, compressor			3/N/PE 400 V/50 Hz	
Max. operating current, compressor	A	8.7	8.7	8.7
Cos φ		0.96	0.96	0.96
Starting current, compressor	A	15	15	15
Fuse rating		B16 A	B16 A	B16 A
IP rating		IP X4	IP X4	IP X4
Indoor unit electrical values				
Heat pump control unit/PCB				
– Rated voltage, control unit/PCB			1/N/PE 230 V/50 Hz	
– Power supply fuse rating		1 x B16A	1 x B16 A	1 x B16 A
– Internal fuse			6.3 A (slow)/250 V	
Instantaneous heating water heater				
– Type AWO-E/AWO-E-AC: Factory-fitted				
– Type AWO: Accessories				
– Rated voltage			1/N/PE 230 V/50 Hz or 3/N/PE 400 V/50 Hz	
– Heating output	kW	9	9	9
– Power supply fuse rating		3 x B16A	3 x B16 A	3 x B16 A
Max. power consumption				
Fan	W	2 x 45	2 x 45	2 x 45
Outdoor unit	kW	5.13	5.13	5.15
Secondary pump (PWM)	W	60	60	60
– Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, outdoor unit	W	15	15	15
Control unit/PCB, indoor unit	W	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000
Refrigerant circuit				
Refrigerant		R410A	R410A	R410A
– Refrigerant charge	kg	2.40	2.40	2.40
– Global warming potential (GWP)*3		1924	1924	1924
– CO_2 equivalent	t	4.6	4.6	4.6
Compressor (hermetically sealed)	Type	Scroll	Scroll	Scroll
– Oil in compressor	Type	3 MAF POE	3 MAF POE	3 MAF POE
– Quantity of oil in compressor	l	1.17	1.17	1.17
Permissible operating pressure				
– High pressure side	bar	43	43	43
	MPa	4.3	4.3	4.3
– Low pressure side	bar	28	28	28
	MPa	2.8	2.8	2.8
Outdoor unit dimensions				
Total length	mm	546	546	546
Total width	mm	1109	1109	1109
Total height	mm	1377	1377	1377
Indoor unit dimensions				
Total length	mm	370	370	370
Total width	mm	450	450	450
Total height	mm	880	880	880
Total weight				
Outdoor unit	kg	153	153	153
Indoor unit				
– Type AWO	kg	40	40	40
– Type AWO-E/AWO-E-AC	kg	41	41	41
Permissible operating pressure, secondary side	bar	3	3	3
	MPa	0.3	0.3	0.3

*3 *Based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

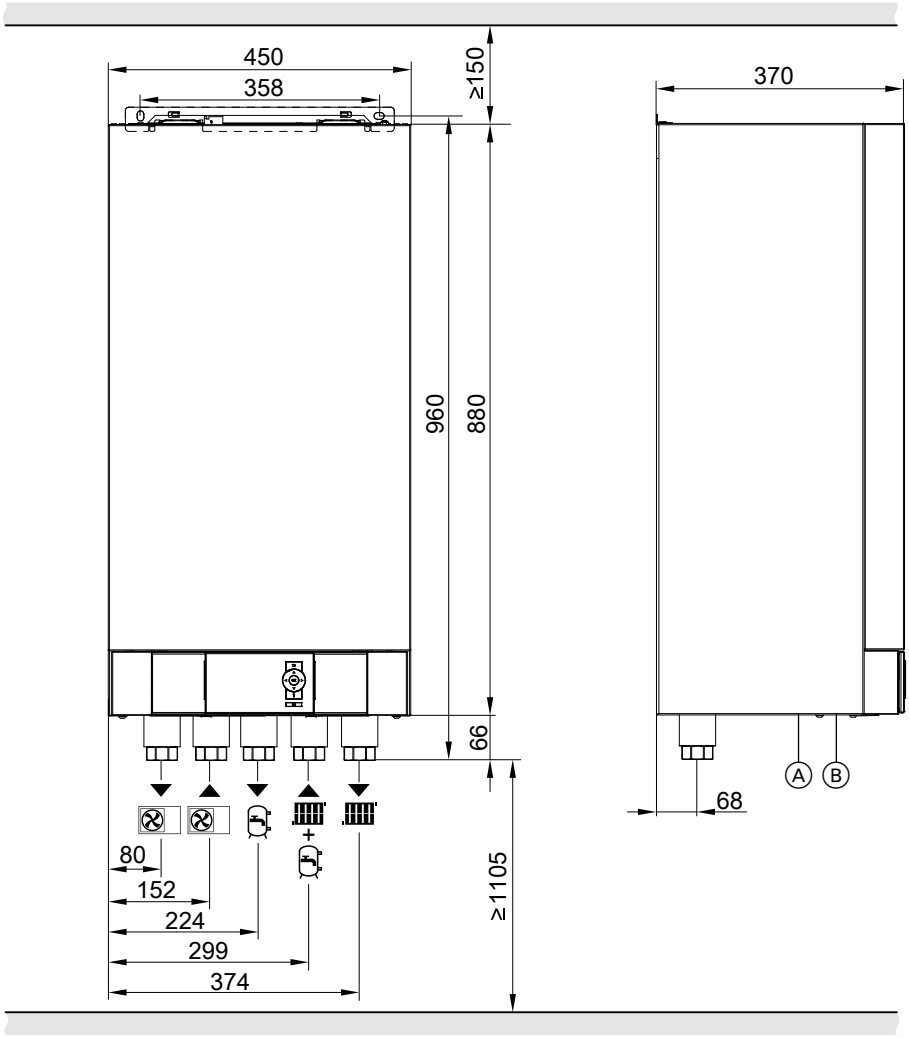
Type AWO/AWO-E/AWO-E-AC		201.A10	201.A13	201.A16
Connections (female thread)				
Heating water flow	G	1¼	1¼	1¼
Heating water return and DHW cylinder return	G	1¼	1¼	1¼
DHW cylinder flow	G	1¼	1¼	1¼
Secondary circuit flow	G	1¼	1¼	1¼
Secondary circuit return	G	1¼	1¼	1¼
Length of connection line between indoor and outdoor units (Hydraulic connection set)	m	1 to 20	1 to 20	1 to 20
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/EN ISO 9614-2) Weighted total sound power level				
– At $A7^{\pm 3\ K}/W55^{\pm 5\ K}$ (max.)	dB(A)	61	61	61
– At $A7^{\pm 3\ K}/W55^{\pm 5\ K}$ in night mode	dB(A)	55	55	55
Energy efficiency class to EU Regulation no. 813/2013 Heating, average climatic conditions				
– Low temperature applications (W35)		A^{+++} *4	A^{+++} *4	A^{+++} *4
– Medium temperature applications (W55)		A^{++}	A^{++}	A^{++}
Performance data as per EU Regulation no. 813/2013 (average climatic conditions) Low temperature applications (W35)				
– Energy efficiency η_S	%	180	182	182
– Rated heating output P_{rated}	kW	9.75	10.99	11.65
– Seasonal coefficient of performance (SCOP)		4.58	4.64	4.62
Medium temperature applications (W55)				
– Energy efficiency η_S	%	132	134	134
– Rated heating output P_{rated}	kW	9.67	11.00	11.98
– Seasonal coefficient of performance (SCOP)		3.37	3.42	3.42
Sound power level to ErP				
Sound power level, outdoor unit	dB(A)	56	56	56

Note

Reduced noise night mode can be enabled at the heat pump control unit at the "Contractor" setting level.

*4 *The new energy efficiency class A^{+++} comes into effect on 26 September 2019.*

Indoor unit dimensions



Ⓐ Cable entry < 42 V
Ⓑ Cable entry 400 V~/230 V~, > 42 V

Connections to the outdoor unit

Symbol	Meaning	Connection to the indoor unit (female thread)
▼ ⊗	Outdoor unit return	G 1¼ (union nut DN 32)
▲ ⊗	Outdoor unit flow	G 1¼ (union nut DN 32)

Secondary circuit connections

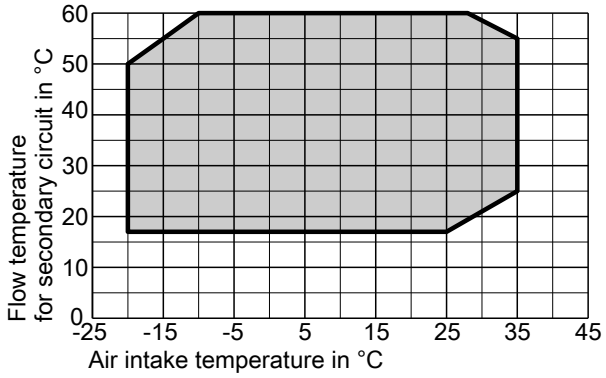
Symbol	Meaning	Connection to the indoor unit (female thread)
▼	DHW cylinder flow (on the heating water side)	G 1¼
▲	Heating water return and DHW cylinder return	G 1¼
▼	Heating water flow	G 1¼

Outdoor unit dimensions

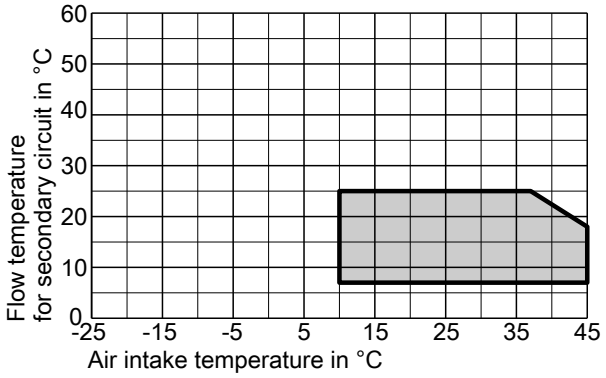
See from page 26.

Application limits to EN 14511

Heating



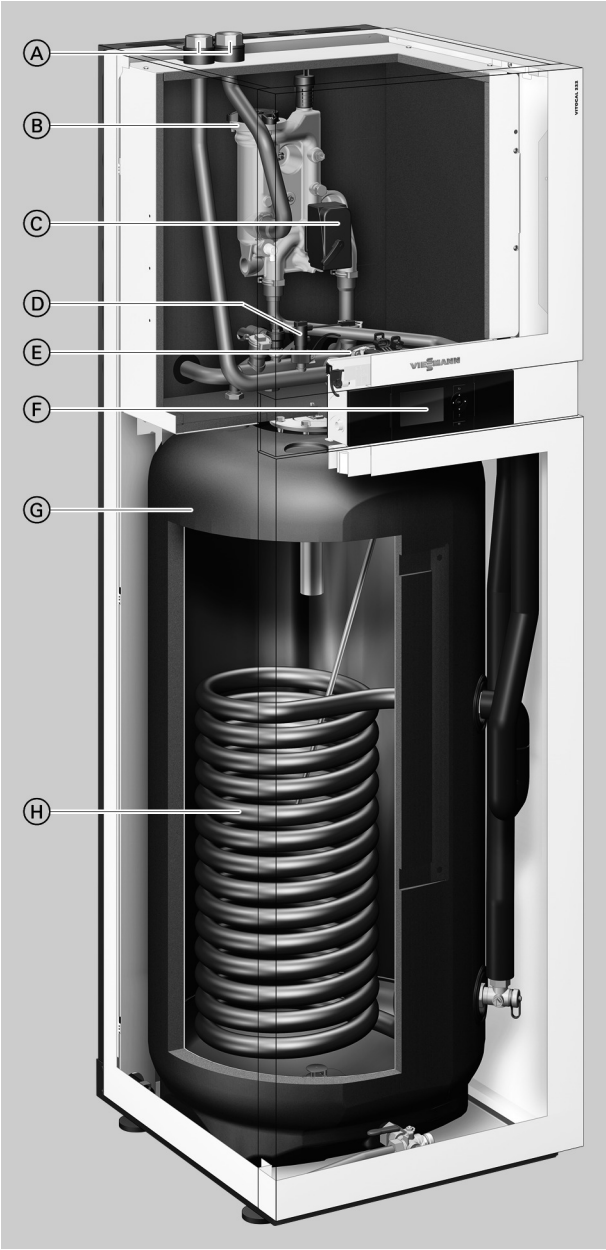
Cooling



3.1 Product description

Benefits

Indoor unit



Ⓐ Outdoor unit flow and return
Ⓑ Instantaneous heating water heater
Ⓒ "Central heating/DHW heating" 3-way diverter valve
Ⓓ Flow switch
Ⓔ Secondary pump (high efficiency circulation pump)
Ⓕ Vitotronic 200 heat pump control unit
Ⓖ DHW cylinder with 220 l capacity
Ⓗ Internal indirect coil for cylinder heating

- Low running costs thanks to high COP (coefficient of performance) to EN 14511: Up to 5.0 (A7/W35)
- Output control and DC inverter for high efficiency in partial load operation
- Maximum flow temperature up to 60 °C at outside temperature of –10 °C
- Compact monoblock indoor unit with high efficiency circulation pump with 220 l DHW cylinder, high efficiency circulation pump, 3-way diverter valve, instantaneous heating water heater, safety assembly and control unit
- Easy to operate Vitotronic control unit with plain text and graphic display
- Optimised utilisation of power generated by an on-site photovoltaic system
- Can be connected to a solar thermal system with solar heat exchanger set (accessory)
- Especially quiet operation thanks to Advanced Acoustic Design (AAD)
- Web-enabled through Vitoconnect (accessories) for operation and service via Viessmann apps

EHPA Quality Label as proof of the COP, for subsidy under the German market incentive programme

Delivered condition

Type AWOT(-M)-E 221.A

Standard delivery:
- Heat pump compact appliance in monoblock version, comprising an indoor and an outdoor unit
- Indoor unit:
  - Integral steel DHW cylinder with Ceraprotect enamel coating, protected from corrosion by a sacrificial magnesium anode, with thermal insulation
  - Integral "central heating/DHW heating" diverter valve
  - Integral high efficiency circulation pump for the secondary circuit
  - Integral safety valve and pressure gauge
  - Integral instantaneous heating water heater
  - Weather-compensated Vitotronic 200, type WO1C heat pump control unit with outside temperature sensor
  - Integral flow rate monitoring
- Outdoor unit:
  - Factory-filled with refrigerant R410A
  - Flange connections
  - Inverter-controlled compressor
  - Diverter valve
  - Electronic expansion valve (EEV)
  - Evaporator
  - Condenser
  - EC fan

Type AWOT(-M)-E-AC 221.A
Equipment level as per type AWOT(-M)-E 221.A, additionally with active cooling function

Required accessories

(Must also be ordered)
- Heating circuit hydraulic connection set for surface mounting, with upward connection: See page 61.
  or
- Heating circuit hydraulic connection set for surface mounting, with connection to left or right: See page 61.

Type overview

Type	Instantaneous heating water heater	Room cooling	Rated voltage	
			Indoor unit	Outdoor unit
AWOT-E 221.A	X	–	230 V~	400 V~
AWOT-M-E 221.A	X	–	230 V~	230 V~
AWOT-E-AC 221.A	X	X	230 V~	400 V~
AWOT-M-E-AC 221.A	X	X	230 V~	230 V~

3.2 Specification

Specification

230 V appliances

Type AWOT-M-E/AWOT-M-E-AC		**221.A04**	**221.A06**	**221.A08**	**221.A10**	**221.A13**	**221.A16**
Heating performance data to EN 14511 (A2/W35)							
Rated heating output	kW	2.61	3.11	4.04	5.01	5.92	6.47
Fan speed	rpm	600	600	650	600	600	600
Power consumption	kW	0.73	0.82	1.02	1.27	1.48	1.79
Coefficient of performance ε (COP) in heating mode		3.57	3.78	3.96	3.96	4.01	3.61
Output control	kW	2.00 to 4.10	2.40 to 5.50	2.80 to 7.00	4.40 to 9.60	4.80 to 10.20	5.20 to 10.70
Heating performance data to EN 14511 (A7/W35, 5 K spread)							
Rated heating output	kW	3.96	4.83	5.62	7.01	7.85	8.64
Fan speed	rpm	600	600	650	600	600	600
Air flow rate	m^3/h	2250	2250	2600	4500	4500	4500
Power consumption	kW	0.87	1.02	1.19	1.49	1.66	1.90
Coefficient of performance ε (COP) in heating mode		4.56	4.72	4.71	4.69	4.72	4.54
Output control	kW	2.44 to 4.18	3.00 to 6.00	3.47 to 7.54	5.48 to 12.60	6.00 to 13.70	6.42 to 14.30
Heating performance data to EN 14511 (A–7/W35)							
Rated heating output	kW	3.81	5.70	6.67	8.69	9.50	11.03
Power consumption	kW	1.31	1.96	2.31	2.77	3.09	3.90
Coefficient of performance ε (COP) in heating mode		2.91	2.91	2.89	3.14	3.07	2.83
Heating performance data to EN 14511 (A35/W7)							
Rated cooling capacity	kW	2.00	3.00	4.00	5.00	6.00	7.00
Fan speed	rpm	600	600	650	900	900	900
Power consumption	kW	0.80	1.20	1.40	1.90	2.30	2.70
Energy efficiency ratio EER in cooling mode		2.40	2.60	2.90	2.70	2.65	2.60
Output control	kW	Up to 3.90	Up to 4.90	Up to 6.20	Up to 8.00	Up to 9.00	Up to 10.30
Heating performance data to EN 14511 (A35/W18)							
Rated cooling capacity	kW	4.00	5.00	6.00	7.00	8.20	9.20
Fan speed	rpm	600	600	650	900	900	900
Power consumption	kW	0.80	1.35	1.40	1.67	2.08	2.42
Energy efficiency ratio EER in cooling mode		4.20	4.20	4.30	4.10	3.95	3.80
Output control	kW	Up to 5.00	Up to 6.00	Up to 7.00	Up to 11.00	Up to 12.50	Up to 13.90
Air intake temperature							
Cooling mode (type AWOT-M-E-AC only)							
– Min.	°C	10	10	10	10	10	10
– Max.	°C	45	45	45	45	45	45
Heating mode							
– Min.	°C	–20	–20	–20	–20	–20	–20
– Max.	°C	35	35	35	35	35	35
Heating water (secondary circuit)							
Minimum flow rate	l/h	700	700	700	1550	1550	1550
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50/40*5	50/40*5	50/40*5	50/40*5	50/40*5	50/40*5
Max. external pressure drop (RFH) at	mbar	705	705	705	400	400	400
minimum flow rate	kPa	70.5	70.5	70.5	40	40	40
Max. flow temperature	°C	60	60	60	60	60	60
Outdoor unit electrical values							
Rated voltage, compressor		1/N/PE 230 V/50 Hz					
Max. operating current, compressor	A	13.0	14.6	14.6	19.9	23.3	23.3
Cos φ		0.99	0.99	0.99	0.99	0.99	0.99
Starting current, compressor	A	15	15	15	15	15	15
Fuse rating		B16 A	B16 A	B16 A	B25 A	B25 A	B25 A
IP rating		IP X4	IP X4	IP X4	IP X4	IP X4	IP X4

*5 *When using the heating water buffer cylinder Vitocell 100-E, type SVPA, part no. ZK03801 in the secondary circuit return*

Type AWOT-M-E/AWOT-M-E-AC		221.A04	221.A06	221.A08	221.A10	221.A13	221.A16
Indoor unit electrical values							
Heat pump control unit/PCB							
– Rated voltage, control unit/PCB				1/N/PE 230 V/50 Hz			
– Power supply fuse rating		1 x B16A	1 x B16 A	1 x B16 A	1 x B16 A	1 x B16 A	1 x B16 A
– Internal fuse				6.3 A (slow)/250 V			
Instantaneous heating water heater							
– Rated voltage				1/N/PE 230 V/50 Hz or 3/N/PE 400 V/50 Hz			
– Heating output	kW	9	9	9	9	9	9
– Power supply fuse rating		3 x B16A	3 x B16 A	3 x B16 A	3 x B16 A	3 x B16 A	3 x B16 A
Max. power consumption							
Fan	W	45	45	115	2 x 115	2 x 115	2 x 115
Outdoor unit	kW	2.85	3.20	3.30	4.55	5.08	5.08
Secondary pump (PWM)	W	60	60	60	60	60	60
– Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, outdoor unit	W	15	15	15	15	15	15
Control unit/PCB, indoor unit	W	10	10	10	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000	1000	1000	1000
Refrigerant circuit							
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A
– Refrigerant charge	kg	1.40	1.40	1.40	2.40	2.40	2.40
– Global warming potential (GWP)*6		1924	1924	1924	1924	1924	1924
– CO_2 equivalent	t	2.7	2.7	2.7	4.6	4.6	4.6
Compressor (hermetically sealed)	Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
– Oil in compressor	Type	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE	3 MAF POE
– Quantity of oil in compressor	l	0.76	0.76	0.76	1.17	1.17	1.17
Permissible operating pressure							
– High pressure side	bar	43	43	43	43	43	43
	MPa	4.3	4.3	4.3	4.3	4.3	4.3
– Low pressure side	bar	28	28	28	28	28	28
	MPa	2.8	2.8	2.8	2.8	2.8	2.8
Integral DHW cylinder							
Capacity	l	220	220	220	220	220	220
Max. draw-off volume at draw-off temperature of 40 °C, storage temperature of 53 °C and draw-off rate of 10 l/min	l	290	290	290	290	290	290
Performance factor N_L to DIN 4708		1.6	1.6	1.6	1.6	1.6	1.6
Max. draw-off rate at the specified performance factor N_L and DHW heating from 10 to 45 °C	l/min	17.3	17.3	17.3	17.3	17.3	17.3
Max. permissible DHW temperature	°C	70	70	70	70	70	70
Outdoor unit dimensions							
Total length	mm	546	546	546	546	546	546
Total width	mm	1109	1109	1109	1109	1109	1109
Total height	mm	753	753	753	1377	1377	1377
Indoor unit dimensions							
Total length	mm	681	681	681	681	681	681
Total width	mm	600	600	600	600	600	600
Total height	mm	1874	1874	1874	1874	1874	1874
Total weight							
Outdoor unit	kg	102	102	103	145	145	145
Indoor unit	kg	164	164	164	164	164	164
Indoor unit with filled DHW cylinder	kg	384	384	384	384	384	384
Permissible operating pressure, secondary side	bar	3	3	3	3	3	3
	MPa	0.3	0.3	0.3	0.3	0.3	0.3

*6 *Based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

Type AWOT-M-E/AWOT-M-E-AC		221.A04	221.A06	221.A08	221.A10	221.A13	221.A16
Secondary circuit connections (with connection accessories, female thread)							
Heating water flow	G	1¼	1¼	1¼	1¼	1¼	1¼
Heating water return	G	1¼	1¼	1¼	1¼	1¼	1¼
DHW	G	¾	¾	¾	¾	¾	¾
Cold water	G	¾	¾	¾	¾	¾	¾
DHW circulation	G	¾	¾	¾	¾	¾	¾
Outdoor unit flow (heating water outlet)	G	1¼	1¼	1¼	1¼	1¼	1¼
Outdoor unit return (heating water inlet)	G	1¼	1¼	1¼	1¼	1¼	1¼
Length of connection line between indoor and outdoor units (Hydraulic connection set)	m	1 to 20	1 to 20	1 to 20	1 to 20	1 to 20	1 to 20
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/EN ISO 9614-2) Weighted total sound power level							
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ (max.)	dB(A)	56	56	58	60	61	61
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ in night mode	dB(A)	50	50	50	55	55	55
Energy efficiency class to EU Regulation no. 813/2013 Heating, average climatic conditions							
– Low temperature applications (W35)		A^{++}	A^{++}	A^{+++}*7	A^{+++}*7	A^{+++}*7	A^{+++}*7
– Medium temperature applications (W55)		A^{+}	A^{++}	A^{++}	A^{++}	A^{++}	A^{++}
DHW heating, draw-off profile (L)		A	A	A	A	A	A
Performance data as per EU Regulation no. 813/2013 (average climatic conditions) Low temperature applications (W35)							
– Energy efficiency η_S	%	173	172	175	176	175	175
– Rated heating output P_{rated}	kW	5.38	5.59	6.82	9.32	9.99	10.61
– Seasonal coefficient of performance (SCOP)		4.40	4.38	4.46	4.47	4.46	4.46
Medium temperature applications (W55)							
– Energy efficiency η_S	%	124	125	127	129	130	130
– Rated heating output P_{rated}	kW	5.23	5.59	6.41	9.35	10.07	10.72
– Seasonal coefficient of performance (SCOP)		3.18	3.21	3.25	3.29	3.32	3.34
– DHW heating energy efficiency η_{wh}	%	119	119	119	117	117	117
Sound power level to ErP							
Sound power level, outdoor unit	dB(A)	53	54	55	56	56	56

Note

Reduced noise night mode can be enabled at the heat pump control unit at the "Contractor" setting level.

400 V appliances

Type AWOT-E/AWOT-E-AC		221.A10	221.A13	221.A16
Heating performance data to EN 14511 (A2/W35)				
Rated heating output	kW	6.10	6.67	7.02
Fan speed	rpm	600	600	600
Power consumption	kW	1.49	1.64	1.78
Coefficient of performance ε (COP) in heating mode		4.10	4.06	3.94
Output control	kW	4.40 to 10.10	4.80 to 10.60	5.20 to 11.20
Heating performance data to EN 14511 (A7/W35, 5 K spread)				
Rated heating output	kW	7.58	8.88	10.11
Fan speed	rpm	600	600	600
Air flow rate	m^3/h	4500	4500	4500
Power consumption	kW	1.51	1.78	2.04
Coefficient of performance ε (COP) in heating mode		5.01	4.99	4.95
Output control	kW	5.45 to 13.60	5.93 to 14.20	6.40 to 14.70
Heating performance data to EN 14511 (A–7/W35)				
Rated heating output	kW	10.09	11.06	11.60
Power consumption	kW	3.17	3.60	3.87
Coefficient of performance ε (COP) in heating mode		3.18	3.07	3.00

*7 *The new energy efficiency class A^{+++} comes into effect on 26 September 2019.*

Type AWOT-E/AWOT-E-AC		221.A10	221.A13	221.A16
Heating performance data to EN 14511 (A35/W7)				
Rated cooling capacity	kW	5.00	6.00	7.00
Fan speed	rpm	600	600	600
Power consumption	kW	1.90	2.30	2.80
Energy efficiency ratio EER in cooling mode		2.70	2.60	2.50
Output control	kW	Up to 8.00	Up to 9.00	Up to 10.00
Heating performance data to EN 14511 (A35/W18)				
Rated cooling capacity	kW	7.00	8.20	9.20
Fan speed	rpm	600	600	600
Power consumption	kW	1.71	2.00	2.30
Energy efficiency ratio EER in cooling mode		4.10	4.10	4.00
Output control	kW	Up to 8.00	Up to 9.00	Up to 10.00
Air intake temperature				
Cooling mode (type AWOT-E-AC only)				
– Min.	°C	10	10	10
– Max.	°C	45	45	45
Heating mode				
– Min.	°C	–20	–20	–20
– Max.	°C	35	35	35
Heating water (secondary circuit)				
Minimum flow rate	l/h	1550	1550	1550
Minimum volume in the heating system, cannot be fitted with shut-off devices	l	50/40*8	50/40*8	50/40*8
Max. external pressure drop (RFH) at minimum flow rate	mbar	400	400	400
	kPa	40	40	40
Max. flow temperature	°C	60	60	60
Outdoor unit electrical values				
Rated voltage, compressor			3/N/PE 400 V/50 Hz	
Max. operating current, compressor	A	8.7	8.7	8.7
Cos φ		0.96	0.96	0.96
Starting current, compressor	A	15	15	15
Fuse rating	A	16	16	16
IP rating		IP X4	IP X4	IP X4
Indoor unit electrical values				
Heat pump control unit/PCB				
– Rated voltage, control unit/PCB			1/N/PE 230 V/50 Hz	
– Power supply fuse rating		1 x B16A	1 x B16 A	1 x B16 A
– Internal fuse			6.3 A (slow)/250 V	
Instantaneous heating water heater				
– Rated voltage			1/N/PE 230 V/50 Hz or 3/N/PE 400 V/50 Hz	
– Heating output	kW	9	9	9
– Power supply fuse rating		3 x B16A	3 x B16 A	3 x B16 A
Max. power consumption				
Fan	W	2 x 45	2 x 45	2 x 45
Outdoor unit	kW	5.13	5.13	5.15
Secondary pump (PWM)	W	60	60	60
– Energy efficiency index EEI		≤ 0.2	≤ 0.2	≤ 0.2
Control unit/PCB, outdoor unit	W	15	15	15
Control unit/PCB, indoor unit	W	10	10	10
Control unit/PCB power, indoor unit	W	1000	1000	1000
Refrigerant circuit				
Refrigerant		R410A	R410A	R410A
– Refrigerant charge	kg	2.40	2.40	2.40
– Global warming potential (GWP)*9		1924	1924	1924
– CO_2 equivalent	t	4.6	4.6	4.6
Compressor (hermetically sealed)	Type	Scroll	Scroll	Scroll
– Oil in compressor	Type	3 MAF POE	3 MAF POE	3 MAF POE
– Quantity of oil in compressor	l	1.17	1.17	1.17
Permissible operating pressure				
– High pressure side	bar	43	43	43
	MPa	4.3	4.3	4.3
– Low pressure side	bar	28	28	28
	MPa	2.8	2.8	2.8

*8 *When using the heating water buffer cylinder Vitocell 100-E, type SVPA, part no. ZK03801 in the secondary circuit return*

*9 *Based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*

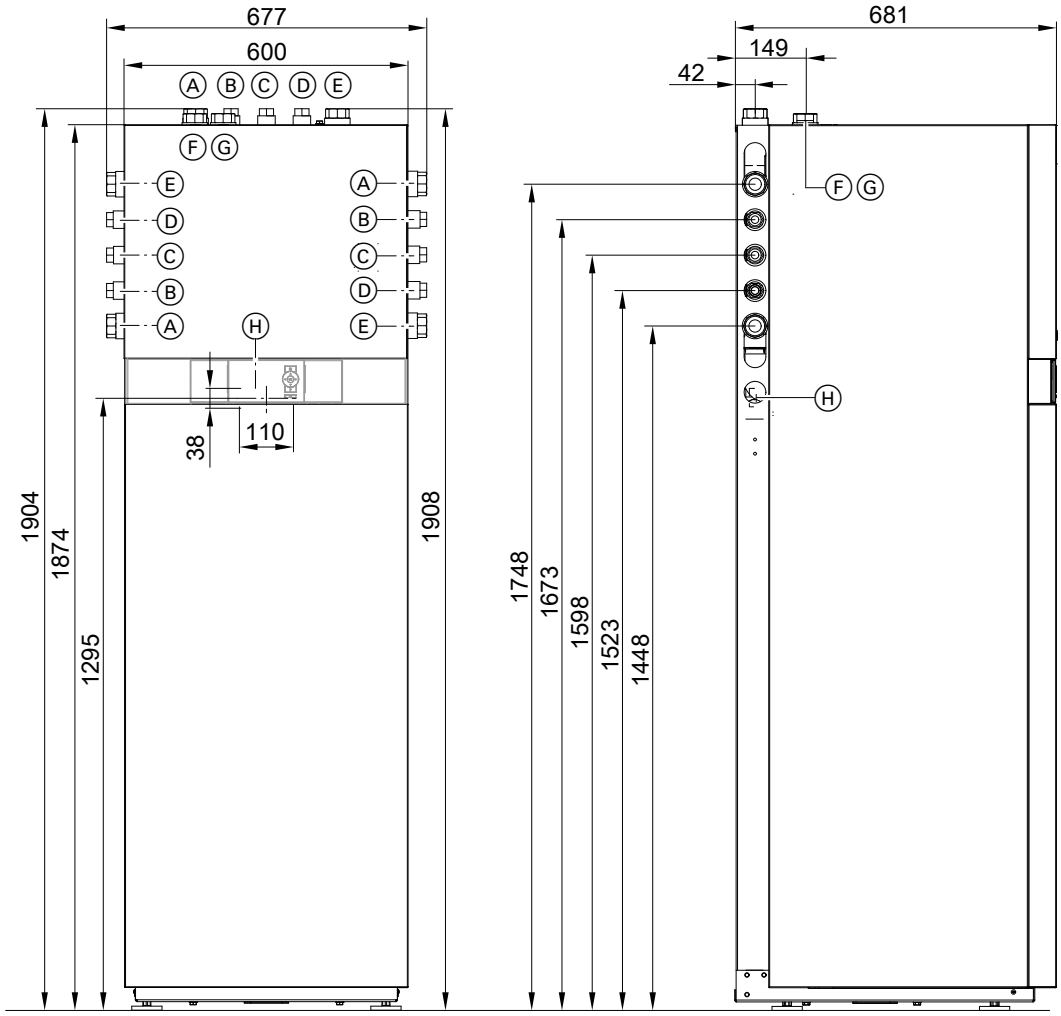
Type AWOT-E/AWOT-E-AC		221.A10	221.A13	221.A16
Integral DHW cylinder				
Capacity	l	220	220	220
Max. draw-off volume at DHW temperature 40 °C, storage temperature 53 °C and draw-off rate 10 l/min	l	290	290	290
Performance factor N_L to DIN 4708		1.6	1.6	1.6
Max. draw-off rate at the specified performance factor N_L and DHW heating from 10 to 45 °C	l/min	17.3	17.3	17.3
Max. permissible DHW temperature	°C	70	70	70
Outdoor unit dimensions				
Total length	mm	546	546	546
Total width	mm	1109	1109	1109
Total height	mm	1377	1377	1377
Indoor unit dimensions				
Total length	mm	681	681	681
Total width	mm	600	600	600
Total height	mm	1874	1874	1874
Total weight				
Outdoor unit	kg	153	153	153
Indoor unit	kg	164	164	164
Indoor unit with filled DHW cylinder	kg	384	384	384
Permissible operating pressure, secondary side	bar	3	3	3
	MPa	0.3	0.3	0.3
Secondary circuit connections (with connection accessories, female thread)				
Heating water flow	G	1¼	1¼	1¼
Heating water return	G	1¼	1¼	1¼
DHW	G	¾	¾	¾
Cold water	G	¾	¾	¾
DHW circulation	G	¾	¾	¾
Secondary circuit flow	G	1¼	1¼	1¼
Secondary circuit return	G	1¼	1¼	1¼
Length of connection line between indoor and outdoor units (Hydraulic connection set)	m	1 to 20	1 to 20	1 to 20
Sound power of outdoor unit at rated heating output (Measurements with reference to EN 12102/ EN ISO 9614-2)				
Weighted total sound power level				
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ (max.)	dB(A)	61	61	61
– At A7$^{\pm 3\ K}$/W55$^{\pm 5\ K}$ in night mode	dB(A)	55	55	55
Energy efficiency class to EU Regulation no. 813/2013				
Heating, average climatic conditions				
– Low temperature applications (W35)		A^{+++}*10	A^{+++}*10	A^{+++}*10
– Medium temperature applications (W55)		A^{++}	A^{++}	A^{++}
DHW heating, draw-off profile (L)		A	A	A
Performance data as per EU Regulation no. 813/2013 (average climatic conditions)				
Low temperature applications (W35)				
– Energy efficiency η_S	%	180	182	182
– Rated heating output P_{rated}	kW	9.75	10.99	11.65
– Seasonal coefficient of performance (SCOP)		4.58	4.64	4.62
Medium temperature applications (W55)				
– Energy efficiency η_S	%	132	134	134
– Rated heating output P_{rated}	kW	9.67	11.00	11.98
– Seasonal coefficient of performance (SCOP)		3.37	3.42	3.42
– DHW heating energy efficiency η_{wh}	%	117	117	117
Sound power level to ErP				
Sound power level, outdoor unit	dB(A)	56	56	56

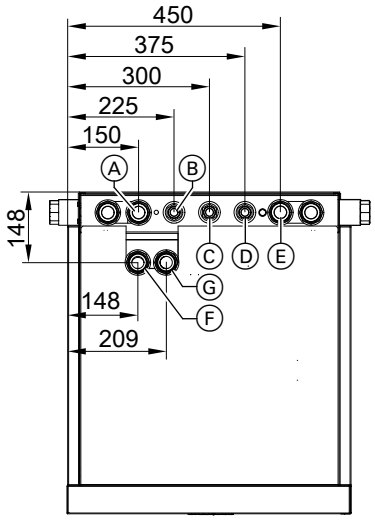
Note

Reduced noise night mode can be enabled at the heat pump control unit at the "Contractor" setting level.

**10 The new energy efficiency class A^{+++} comes into effect on 26 September 2019.*

Indoor unit dimensions





Ⓐ Heating water return G 1¼ (female thread)
Ⓑ Cold water G ¾ (female thread)
Ⓒ DHW circulation G ¾ (female thread)
Ⓓ DHW G ¾ (female thread)
Ⓔ Heating water flow G 1¼ (female thread)
Ⓕ Return, outdoor unit (heating water outlet) G 1¼ (union nut DN 32, female thread)
Ⓖ Flow, outdoor unit (heating water outlet) G 1¼ (union nut DN 32, female thread)
Ⓗ Cable entry for electrical cables on the back of the appliance:
- LV leads < 42 V
- Power cables 400 V~/230 V~

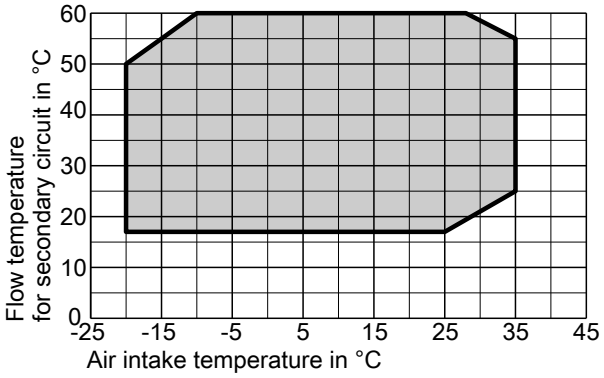
5831388

Outdoor unit dimensions

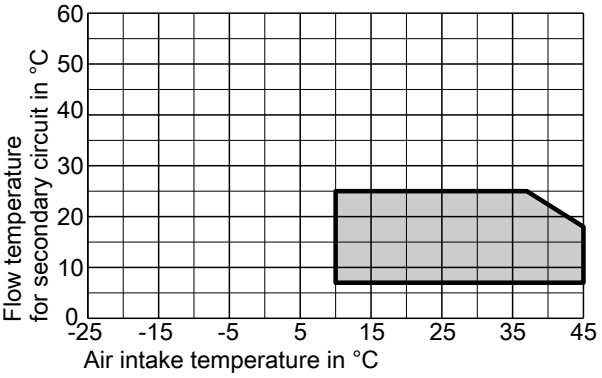
See from page 26.

Application limits to EN 14511

Heating



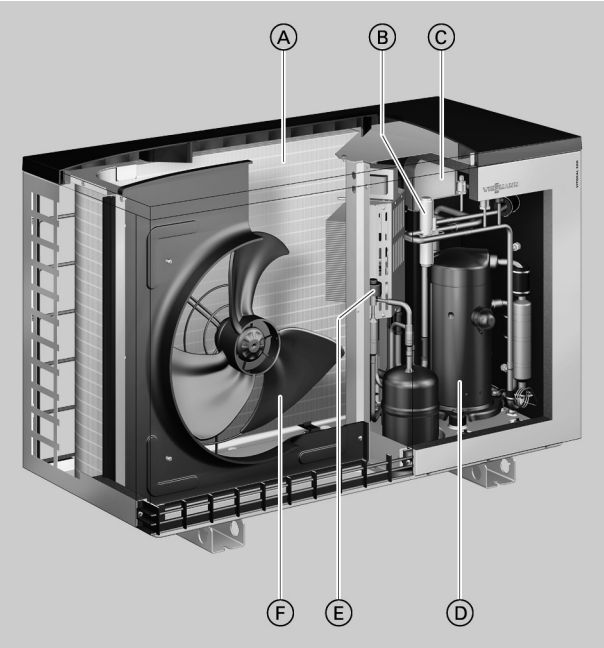
Cooling



3

4.1 Outdoor unit types 201.A04 to 201.A08 and 221.A04 to 221.A08, 230 V~

Description



Ⓐ Coated evaporator with corrugated fins for higher efficiency
Ⓑ 4-way diverter valve
Ⓒ Condenser
Ⓓ Hermetically sealed scroll compressor with output-dependent control
Ⓔ Electronic expansion valve
Ⓕ Power saving variable speed EC fan

Allocation to heat pumps

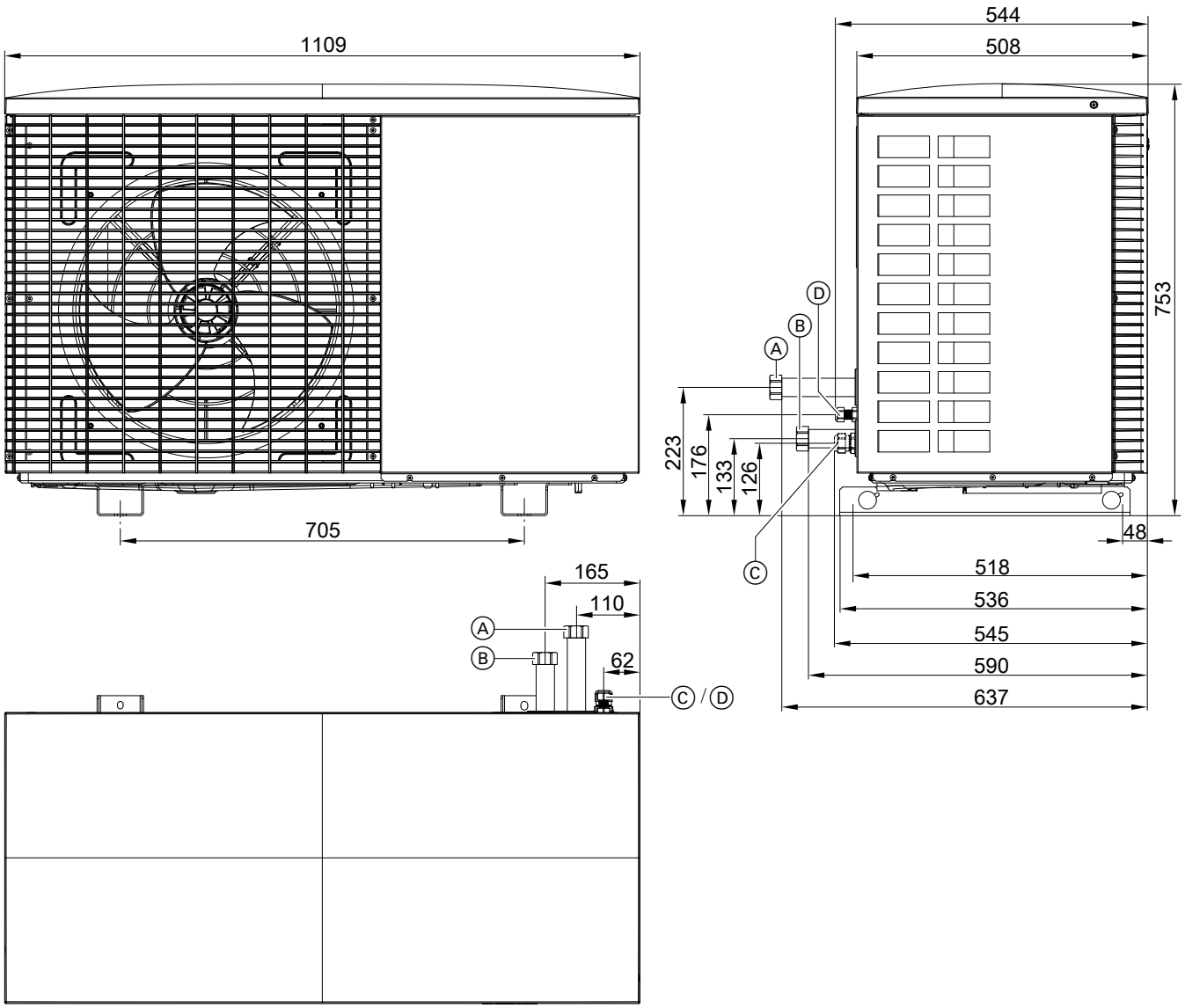
Vitocal 200-A

Type
- AWO-M 201.A04
- AWO-M-E 201.A04
- AWO-M-E-AC 201.A04
- AWO-M 201.A06
- AWO-M-E 201.A06
- AWO-M-E-AC 201.A06
- AWO-M 201.A08
- AWO-M-E 201.A08
- AWO-M-E-AC 201.A08

Vitocal 222-A

Type
- AWOT-M-E 221.A04
- AWOT-M-E 221.A06
- AWOT-M-E 221.A08
- AWOT-M-E-AC 221.A04
- AWOT-M-E-AC 221.A06
- AWOT-M-E-AC 221.A08

Dimensions



Ⓐ Outdoor unit flow (heating water outlet) G 1¼ (union nut supplied, female thread)
Ⓑ Outdoor unit return (heating water outlet) G 1¼ (union nut supplied, female thread)
Ⓒ Power cable inlet
Ⓓ Modbus cable inlet for indoor/outdoor unit

4.2 Outdoor unit types 201.A10 to 201.A16 and 221.A10 to 221.A16, 230 V~ and 400 V~

Description

Ⓐ Coated evaporator with corrugated fins for higher efficiency
Ⓑ 4-way diverter valve
Ⓒ Condenser
Ⓓ Hermetically sealed scroll compressor with output-dependent control
Ⓔ Electronic expansion valve
Ⓕ Power saving variable speed EC fan

Allocation to heat pumps

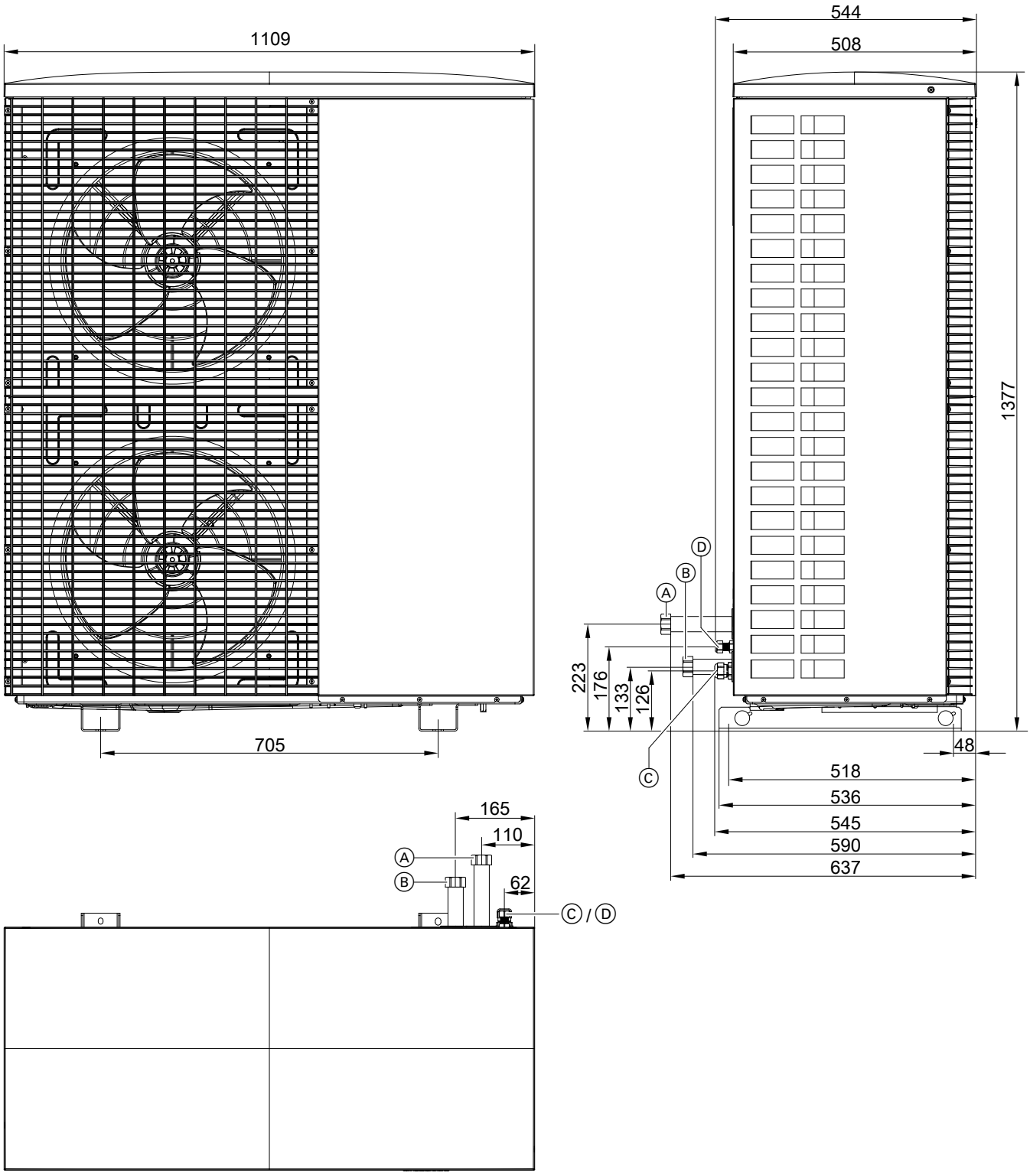
Vitocal 200-A

Type
- AWO 201.A10
- AWO-E 201.A10
- AWO-E-AC 201.A10
- AWO-M 201.A10
- AWO-M-E 201.A10
- AWO-M-E-AC 201.A10
- AWO 201.A13
- AWO-E 201.A13
- AWO-E-AC 201.A13
- AWO-M 201.A13
- AWO-M-E 201.A13
- AWO-M-E-AC 201.A13
- AWO 201.A16
- AWO-E 201.A16
- AWO-E-AC 201.A16
- AWO-M 201.A16
- AWO-M-E 201.A16
- AWO-M-E-AC 201.A16

Vitocal 222-A

Type
- AWOT-E 221.A10
- AWOT-E-AC 221.A10
- AWOT-M-E 221.A10
- AWOT-M-E-AC 221.A10
- AWOT-E 221.A13
- AWOT-E-AC 221.A13
- AWOT-M-E 221.A13
- AWOT-M-E-AC 221.A13
- AWOT-E 221.A16
- AWOT-E-AC 221.A16
- AWOT-M-E 221.A16
- AWOT-M-E-AC 221.A16

Dimensions



Ⓐ Outdoor unit flow (heating water outlet) G 1¼ (union nut supplied, female thread)
Ⓑ Outdoor unit return (heating water outlet) G 1¼ (union nut supplied, female thread)
Ⓒ Power cable inlet
Ⓓ Modbus cable inlet for indoor/outdoor unit

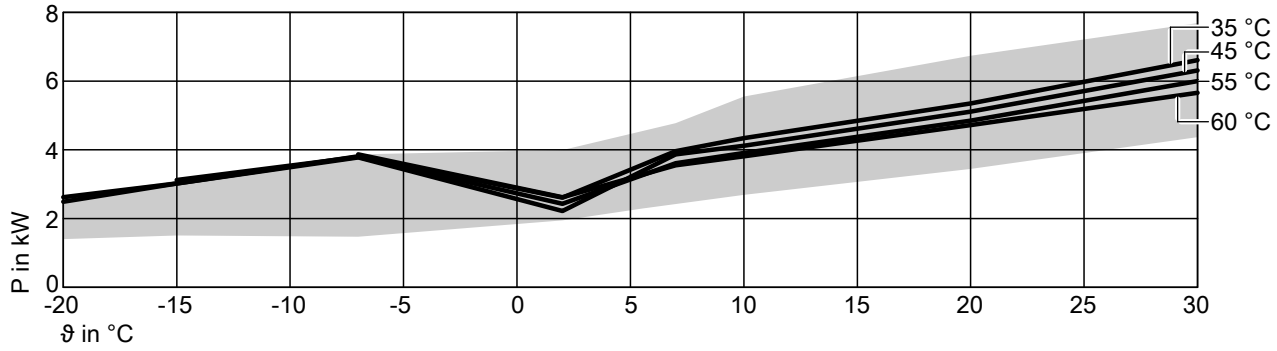
5.1 Performance diagrams, outdoor unit types 201.A04 and 221.A04, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A04
- AWO-M-E 201.A04
- AWO-M-E-AC 201.A04

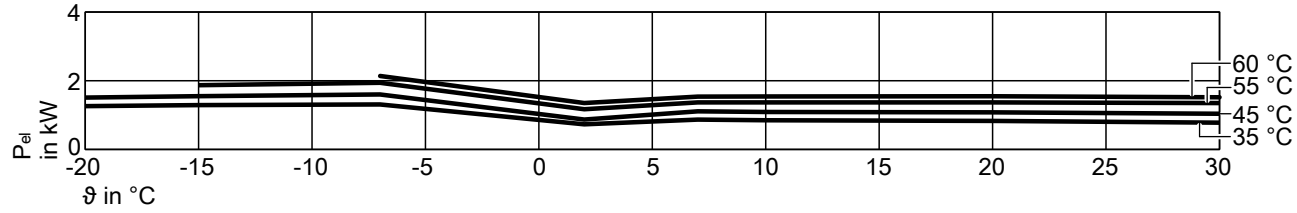
Vitocal 222-A, type
- AWOT-M-E 221.A04
- AWOT-M-E-AC 221.A04

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C

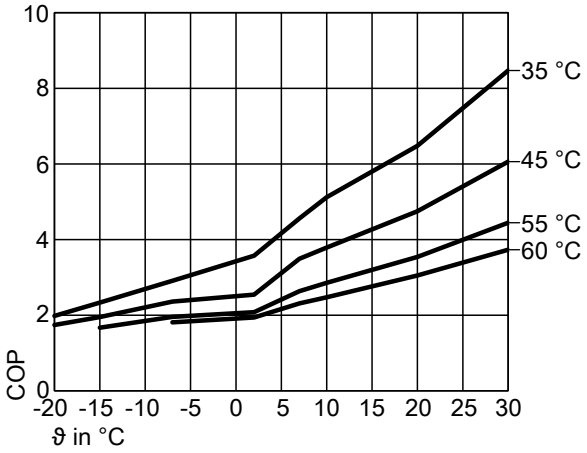


Possible output range

Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ	Air intake temperature
P	Heating output
P_{el}	Power consumption
COP	Coefficient of performance

Note
- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	W	°C	35							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	2.49	3.02	3.81	4.08	4.18	5.33	6.47	7.37
Rated heating output		kW	2.49	3.02	3.81	2.61	3.96	4.34	5.35	6.61
Power consumption		kW	1.26	1.29	1.31	0.73	0.87	0.85	0.83	0.78
Coefficient of performance ε (COP)			1.98	2.33	2.91	3.57	4.56	5.12	6.48	8.47
Min. heating output		kW	1.40	1.51	1.47	1.95	2.44	2.69	3.45	4.37

5831388

Curves (cont.)

Operating point	W	°C	45							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	2.62	3.02	3.78	3.99	4.78	5.55	6.74	7.69
Rated heating output		kW	2.62	3.02	3.78	2.22	3.87	4.12	5.11	6.31
Power consumption		kW	1.51	1.55	1.60	0.87	1.11	1.09	1.08	1.04
Coefficient of performance ε (COP)			1.74	1.95	2.36	2.54	3.49	3.79	4.75	6.06
Min. heating output		kW	1.39	1.62	1.95	1.83	2.27	2.50	3.26	4.13

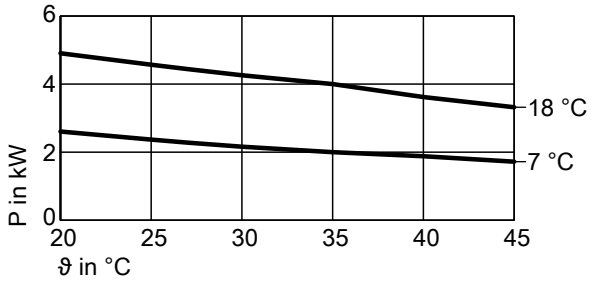
Operating point	W	°C	55							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW		3.12	3.79	3.86	4.97	5.28	6.53	7.35
Rated heating output		kW		3.12	3.79	2.43	3.61	3.91	4.85	6.00
Power consumption		kW		1.87	1.94	1.17	1.37	1.37	1.37	1.35
Coefficient of performance ε (COP)				1.67	1.95	2.08	2.64	2.85	3.54	4.44
Min. heating output		kW		1.55	2.08	2.53	2.65	2.90	3.69	4.54

Operating point	W	°C	60							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW			3.87	3.98	4.91	5.16	6.38	7.17
Rated heating output		kW			3.87	2.62	3.55	3.81	4.72	5.66
Power consumption		kW			2.14	1.35	1.54	1.54	1.55	1.52
Coefficient of performance ε (COP)					1.81	1.94	2.31	2.47	3.05	3.73
Min. heating output		kW			2.00	2.64	2.95	3.15	3.93	4.58

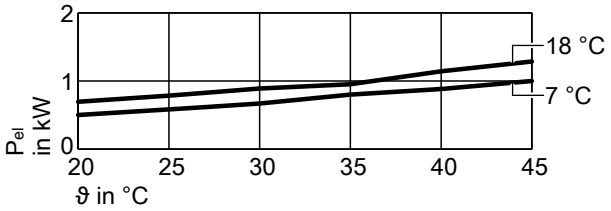
Cooling

- **Vitocal 200-A**, type AWO-M-E-AC 201.A04
- **Vitocal 222-A**, type AWOT-M-E-AC 221.A04

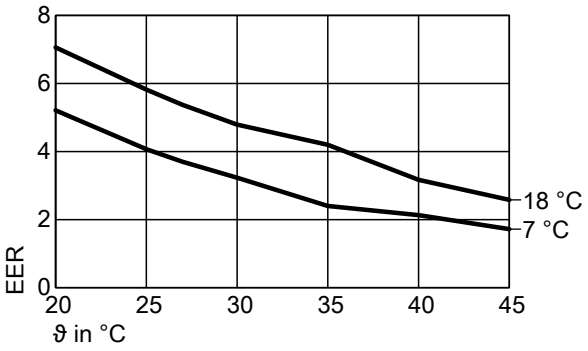
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

- *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	W	°C	18						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	4.91	4.57	4.44	4.26	4.00	3.62	3.32
Power consumption		kW	0.69	0.79	0.83	0.89	0.95	1.14	1.29
Energy efficiency ratio EER			7.06	5.82	5.37	4.79	4.20	3.17	2.58

Operating point	W	°C	7						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	2.61	2.37	2.28	2.16	2.00	1.88	1.72
Power consumption		kW	0.50	0.58	0.62	0.67	0.80	0.88	1.00
Energy efficiency ratio EER			5.21	4.07	3.70	3.23	2.40	2.13	1.72

5831388

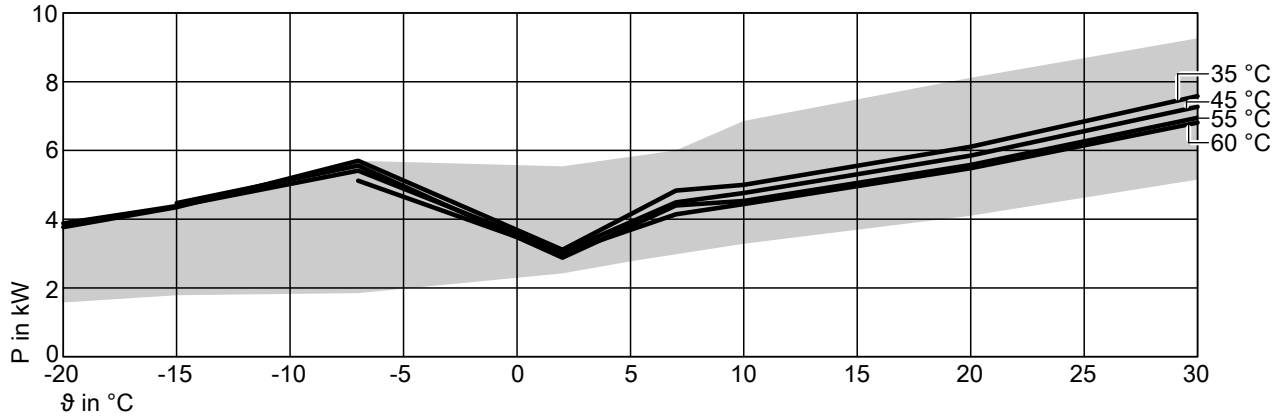
5.2 Performance diagrams, outdoor unit types 201.A06 and 221.A06, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A06
- AWO-M-E 201.A06
- AWO-M-E-AC 201.A06

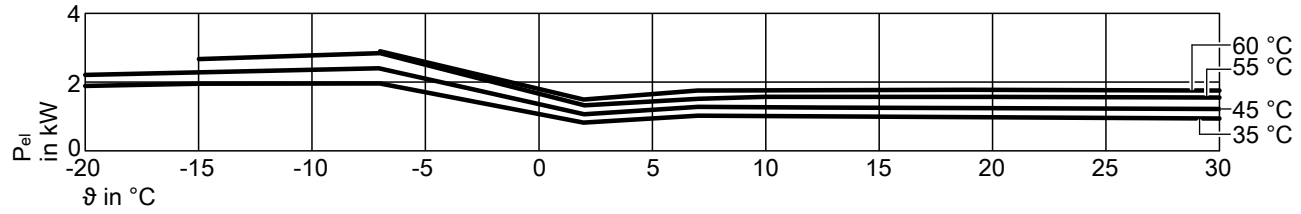
Vitocal 222-A, type
- AWOT-M-E 221.A06
- AWOT-M-E-AC 221.A06

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C

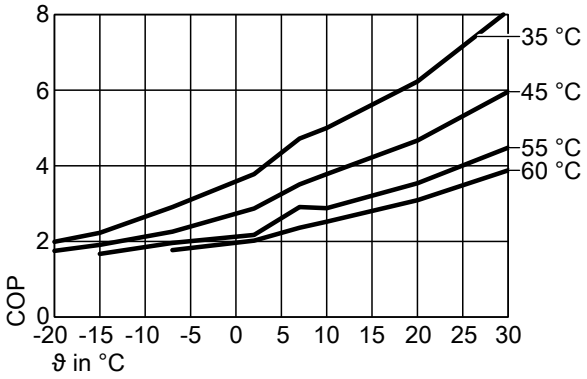


Possible output range

Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ	Air intake temperature
P	Heating output
P_{el}	Power consumption
COP	Coefficient of performance

Note
- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Curves (cont.)

Operating point	W	°C	35							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	3.77	4.35	5.70	5.54	6.00	6.86	8.11	9.26
Rated heating output		kW	3.77	4.35	5.70	3.11	4.83	5.00	6.11	7.58
Power consumption		kW	1.89	1.95	1.96	0.82	1.02	1.00	0.98	0.94
Coefficient of performance ε (COP)			1.99	2.23	2.91	3.78	4.72	5.00	6.23	8.10
Min. heating output		kW	1.58	1.79	1.85	2.42	3.01	3.29	4.10	5.15

Operating point	W	°C	45							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	3.88	4.38	5.41	5.43	5.06	6.65	7.85	8.93
Rated heating output		kW	3.88	4.38	5.41	3.05	4.49	4.76	5.85	7.27
Power consumption		kW	2.21	2.29	2.40	1.06	1.28	1.26	1.25	1.22
Coefficient of performance ε (COP)			1.75	1.91	2.26	2.87	3.51	3.78	4.67	5.96
Min. heating output		kW	1.64	1.88	2.29	2.28	2.82	3.09	3.90	4.84

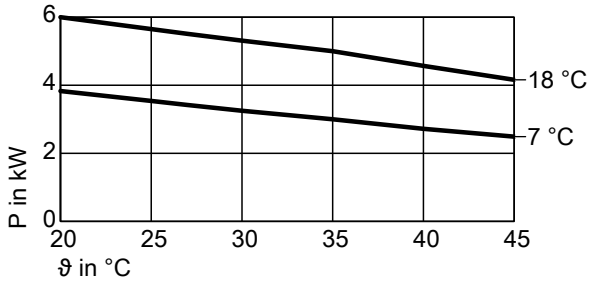
Operating point	W	°C	55							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW		4.47	5.56	5.07	5.79	6.16	7.57	8.58
Rated heating output		kW		4.47	5.56	2.88	4.40	4.53	5.58	6.95
Power consumption		kW		2.67	2.84	1.33	1.51	1.57	1.57	1.55
Coefficient of performance ε (COP)				1.67	1.96	2.17	2.91	2.88	3.54	4.48
Min. heating output		kW		1.83	2.37	2.68	3.14	3.42	4.28	5.30

Operating point	W	°C	60							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW			5.12	5.15	5.75	6.06	7.41	8.16
Rated heating output		kW			5.12	3.01	4.14	4.44	5.48	6.81
Power consumption		kW			2.89	1.49	1.75	1.76	1.77	1.76
Coefficient of performance ε (COP)					1.77	2.02	2.36	2.52	3.09	3.88
Min. heating output		kW			2.46	3.02	3.38	3.60	4.49	5.32

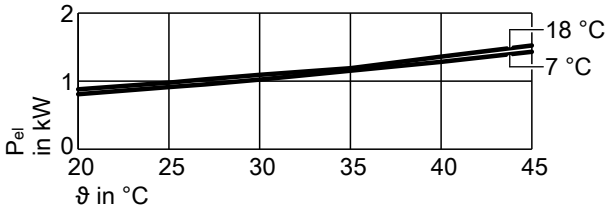
Cooling

- **Vitocal 200-A**, type AWO-M-E-AC 201.A06
- **Vitocal 222-A**, type AWOT-M-E-AC 221.A06

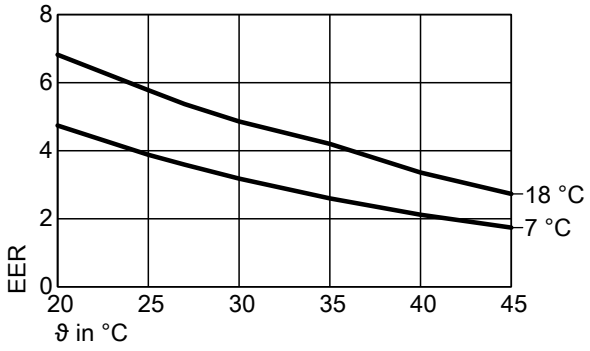
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ	Air intake temperature
P	Cooling capacity
P_{el}	Power consumption
EER	Coefficient of performance

Note

- *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

5831388

Curves (cont.)

Operating point	W	°C	18						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	6.00	5.65	5.51	5.31	5.00	4.57	4.16
Power consumption		kW	0.88	0.98	1.03	1.09	1.19	1.36	1.52
Energy efficiency ratio EER			6.82	5.78	5.37	4.86	4.20	3.36	2.73

Operating point	W	°C	7						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	3.83	3.54	3.42	3.25	3.00	2.72	2.49
Power consumption		kW	0.81	0.91	0.95	1.02	1.15	1.28	1.43
Energy efficiency ratio EER			4.74	3.88	3.59	3.18	2.60	2.12	1.74

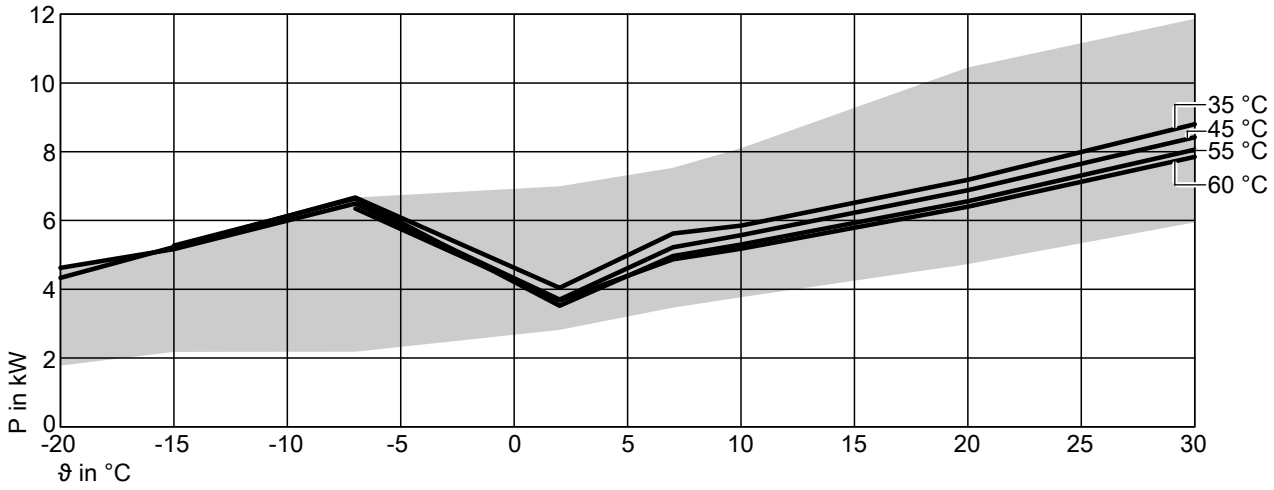
5.3 Performance diagrams, outdoor unit types 201.A08 and 221.A08, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A08
- AWO-M-E 201.A08
- AWO-M-E-AC 201.A08

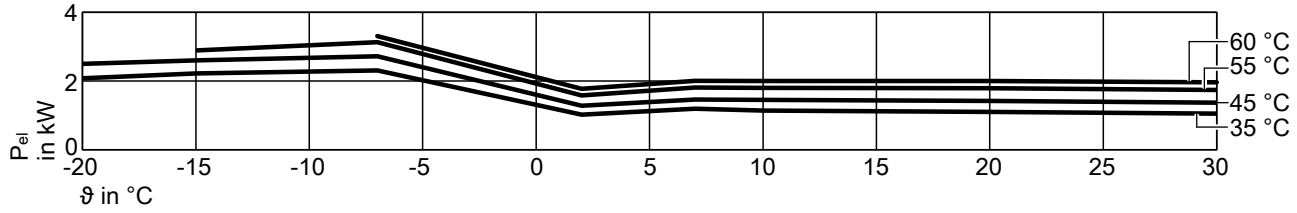
Vitocal 222-A, type
- AWOT-M-E 221.A08
- AWOT-M-E-AC 221.A08

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C

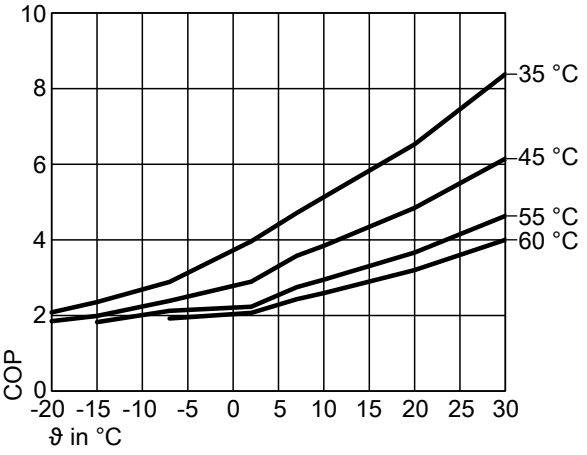


Possible output range

Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ	Air intake temperature
P	Heating output
P_{el}	Power consumption
COP	Coefficient of performance

Note
- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

5831388

Curves (cont.)

Operating point	W	°C	35							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	4.33	5.23	6.67	6.99	7.54	8.10	10.45	11.87
Rated heating output		kW	4.33	5.23	6.67	4.04	5.62	5.85	7.18	8.80
Power consumption		kW	2.08	2.22	2.31	1.02	1.19	1.14	1.10	1.05
Coefficient of performance ε (COP)			2.08	2.36	2.89	3.96	4.71	5.13	6.53	8.38
Min. heating output		kW	1.78	2.18	2.18	2.82	3.47	3.77	4.73	5.95

Operating point	W	°C	45							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW	4.62	5.17	6.49	6.85	7.06	8.81	10.13	11.46
Rated heating output		kW	4.62	5.17	6.49	3.70	5.22	5.57	6.88	8.42
Power consumption		kW	2.50	2.60	2.72	1.28	1.46	1.45	1.42	1.37
Coefficient of performance ε (COP)			1.85	1.99	2.39	2.89	3.58	3.84	4.85	6.15
Min. heating output		kW	1.94	2.22	2.77	2.65	3.25	3.56	4.48	5.62

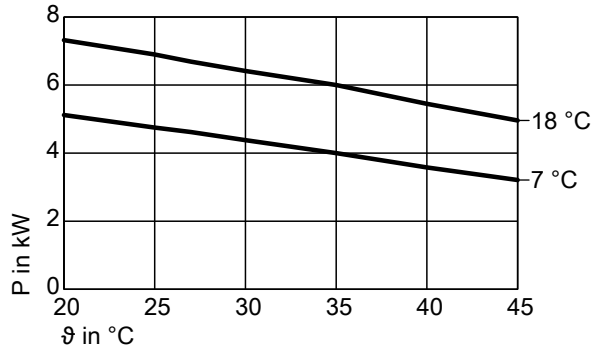
Operating point	W	°C	55							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW		5.27	6.64	6.72	6.82	8.42	9.78	11.01
Rated heating output		kW		5.27	6.64	3.52	4.97	5.30	6.56	8.06
Power consumption		kW		2.89	3.13	1.58	1.81	1.80	1.79	1.74
Coefficient of performance ε (COP)				1.82	2.12	2.23	2.75	2.94	3.66	4.63
Min. heating output		kW		2.18	2.82	3.20	3.71	4.03	5.04	6.26

Operating point	W	°C	60							
	A	°C	–20	–15	–7	2	7	10	20	30
Max. heating output		kW			6.35	6.26	6.59	8.00	9.57	10.76
Rated heating output		kW			6.35	3.67	4.87	5.18	6.40	7.85
Power consumption		kW			3.31	1.77	2.00	2.00	2.00	1.96
Coefficient of performance ε (COP)					1.92	2.07	2.43	2.59	3.20	4.00
Min. heating output		kW			2.90	3.58	4.03	4.29	5.35	6.46

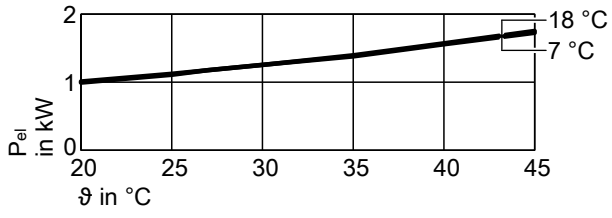
Cooling

- **Vitocal 200-A**, type AWO-M-E-AC 201.A08
- **Vitocal 222-A**, type AWOT-M-E-AC 221.A08

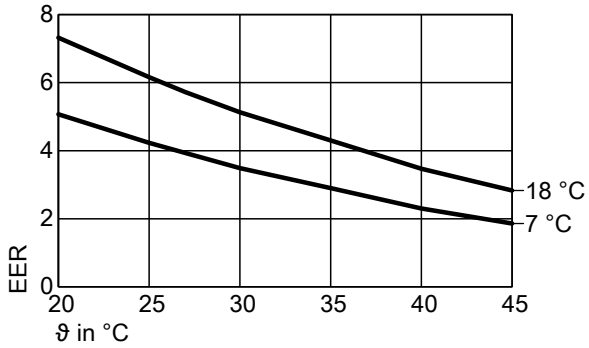
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

- *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

5

5831388

Curves (cont.)

Operating point	W	°C	18						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	7.32	6.90	6.69	6.41	6.00	5.45	4.96
Power consumption		kW	0.99	1.11	1.18	1.25	1.40	1.57	1.75
Energy efficiency ratio EER			7.32	6.16	5.72	5.13	4.30	3.47	2.83

Operating point	W	°C	7						
	A	°C	20	25	27	30	35	40	45
Cooling capacity		kW	5.12	4.75	4.62	4.38	4.00	3.58	3.21
Power consumption		kW	1.01	1.12	1.18	1.26	1.38	1.56	1.73
Energy efficiency ratio EER			5.07	4.23	3.93	3.49	2.90	2.3	1.86

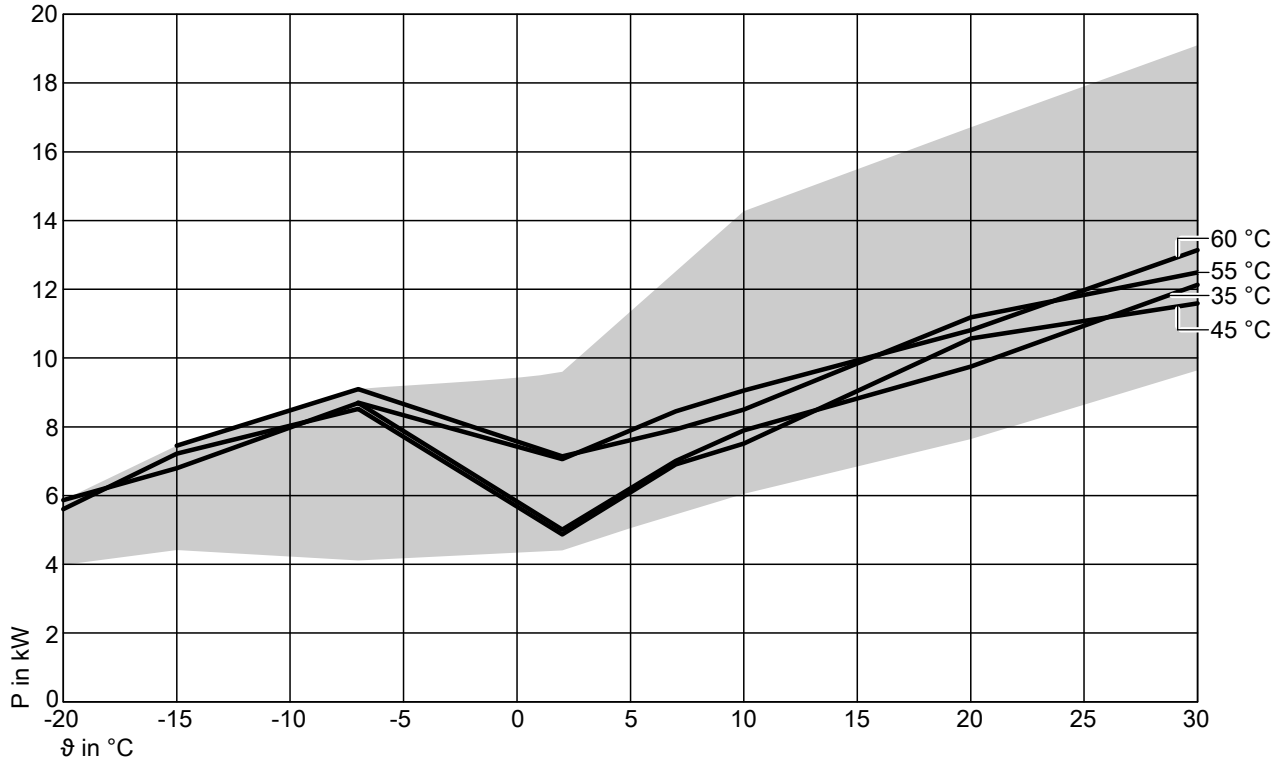
5.4 Performance diagrams, outdoor unit types 201.A10 and 221.A10, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A10
- AWO-M-E 201.A10
- AWO-M-E-AC 201.A10

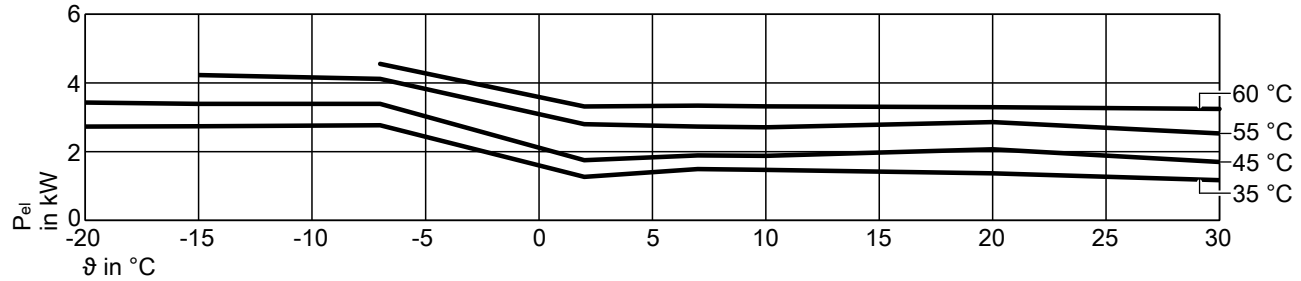
Vitocal 222-A, type
- AWOT-M-E 221.A10
- AWOT-M-E-AC 221.A10

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

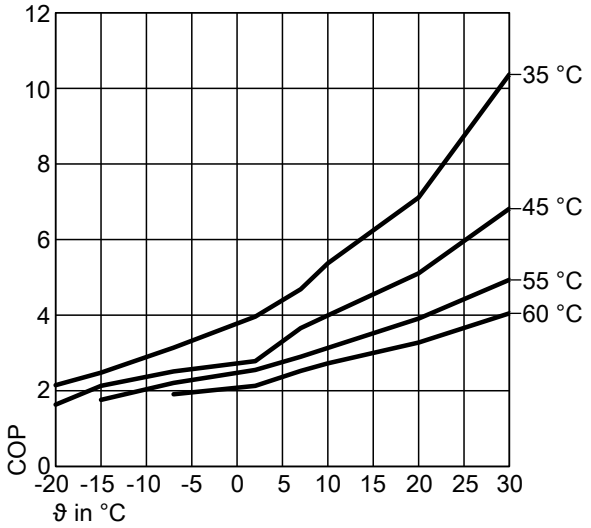
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**				**35**				
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	5.87	6.80	8.69	9.60	12.60	14.27	16.71	19.10
Rated heating output		kW	5.87	6.80	8.69	5.01	7.01	7.90	9.75	12.13
Power consumption		kW	2.73	2.74	2.77	1.27	1.49	1.47	1.37	1.17
Coefficient of performance ε (COP)			2.15	2.48	3.14	3.96	4.69	5.37	7.12	10.37
Min. heating output		kW	3.98	4.42	4.11	4.41	5.48	6.05	7.64	9.64

Operating point	**W**	**°C**				**45**				
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	5.61	7.22	8.52	9.39	9.66	13.84	15.25	17.31
Rated heating output		kW	5.61	7.22	8.52	4.87	6.91	7.51	10.57	11.59
Power consumption		kW	3.43	3.39	3.39	1.75	1.89	1.88	2.07	1.70
Coefficient of performance ε (COP)			1.64	2.13	2.51	2.78	3.66	3.99	5.11	6.82
Min. heating output		kW	3.84	4.83	5.85	5.14	5.13	5.64	7.26	9.17

Operating point	**W**	**°C**				**55**				
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		7.45	9.10	9.27	12.17	12.89	14.67	16.60
Rated heating output		kW		7.45	9.10	7.14	7.93	8.50	11.18	12.49
Power consumption		kW		4.23	4.12	2.80	2.73	2.71	2.86	2.53
Coefficient of performance ε (COP)				1.76	2.21	2.55	2.90	3.14	3.91	4.94
Min. heating output		kW		4.25	6.28	6.50	7.95	8.52	10.43	12.83

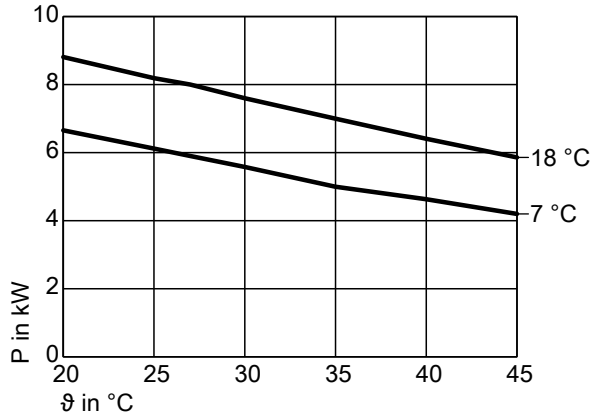
Operating point	**W**	**°C**				**60**				
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			8.70	8.75	10.87	11.49	13.56	14.97
Rated heating output		kW			8.70	7.06	8.45	9.06	10.81	13.14
Power consumption		kW			4.55	3.31	3.34	3.32	3.30	3.24
Coefficient of performance ε (COP)					1.91	2.13	2.53	2.73	3.28	4.05
Min. heating output		kW			6.37	7.06	8.44	8.99	10.80	13.21

Curves (cont.)

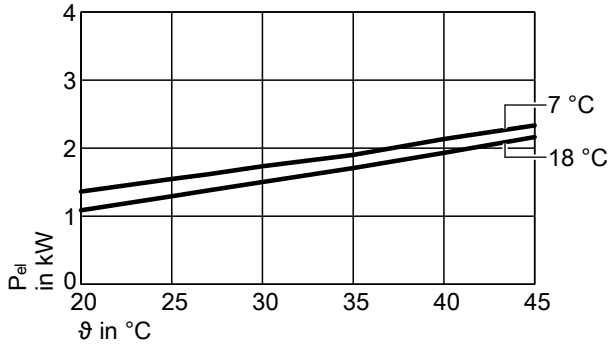
Cooling

■ **Vitocal 200-A**, type AWO-M-E-AC 201.A10
■ **Vitocal 222-A**, type AWOT-M-E-AC 221.A10

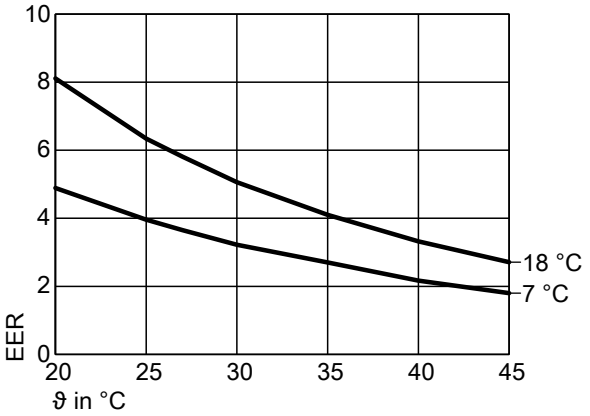
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

■ *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
■ *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**18**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	8.81	8.19	8.00	7.60	7.00	6.41	5.86
Power consumption		kW	1.09	1.29	1.38	1.50	1.71	1.93	2.20
Energy efficiency ratio EER			8.11	6.34	5.81	5.06	4.10	3.32	2.71

Operating point	**W**	**°C**	**7**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	6.66	6.12	5.90	5.58	5.00	4.63	4.20
Power consumption		kW	1.36	1.55	1.62	1.73	1.90	2.13	2.33
Energy efficiency ratio EER			4.89	3.96	3.65	3.22	2.70	2.17	1.80

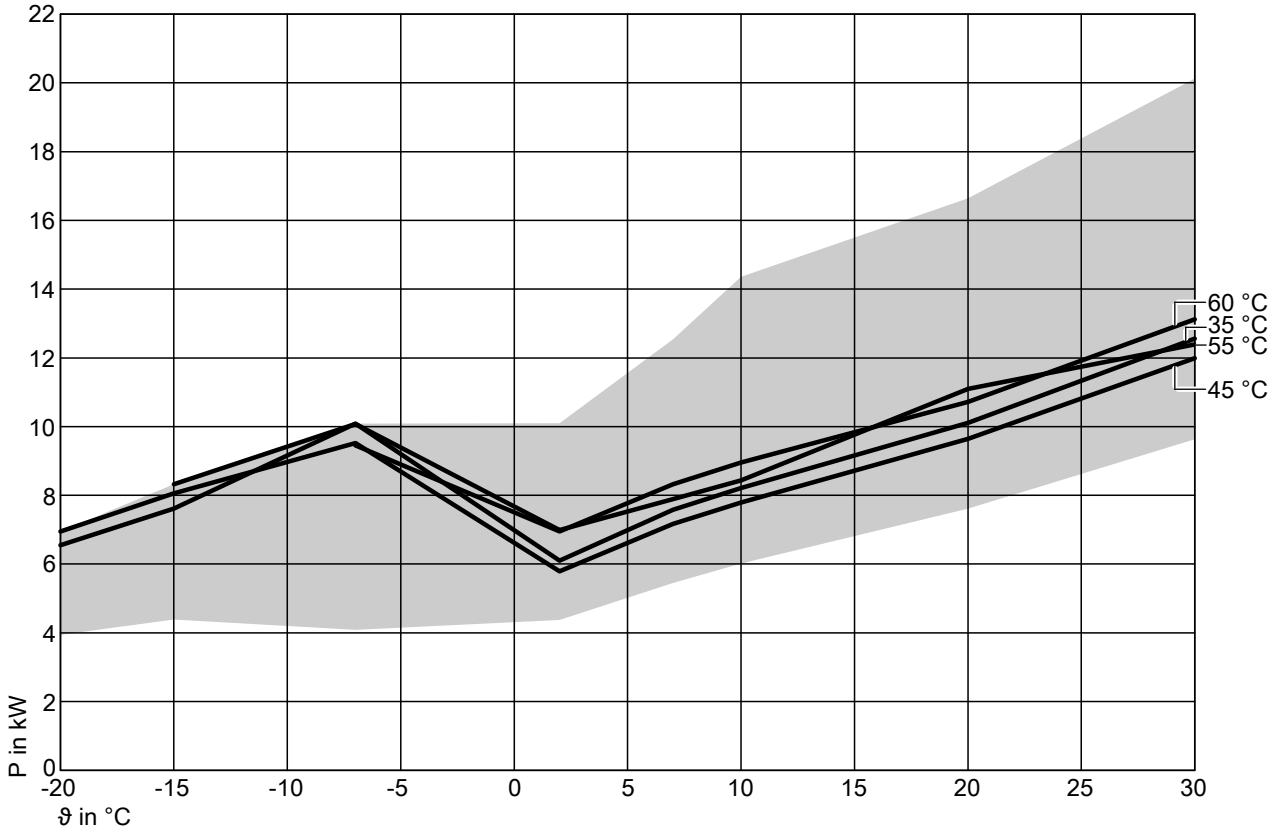
5.5 Performance diagrams, outdoor unit types 201.A10 and 221.A10, 400 V~

Heating

Vitocal 200-A, type
- AWO 201.A10
- AWO-E 201.A10
- AWO-E-AC 201.A10

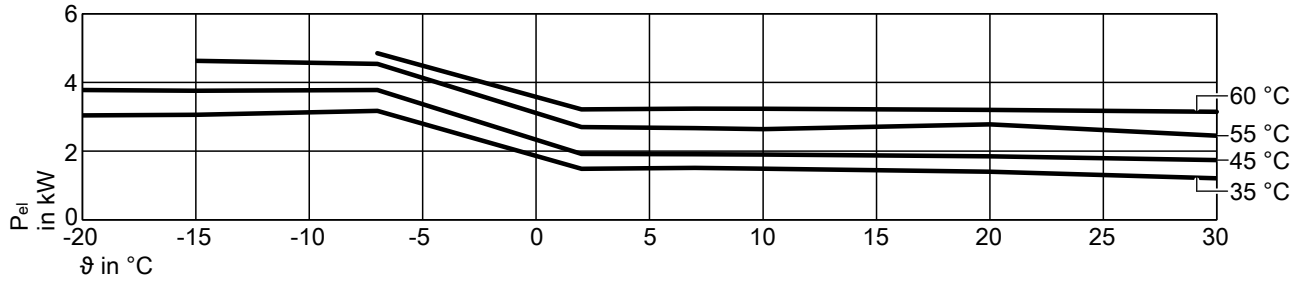
Vitocal 222-A, type
- AWOT-E 221.A10
- AWOT-E-AC 221.A10

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

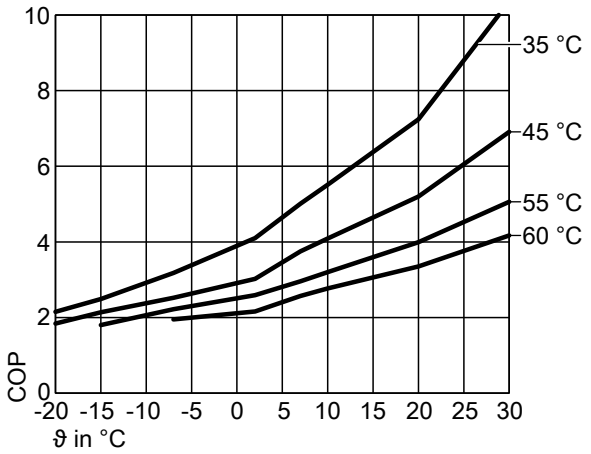
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**35**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	6.55	7.61	10.09	10.09	12.60	14.35	16.64	20.13
Rated heating output		kW	6.55	7.61	10.09	6.10	7.58	8.21	10.11	12.56
Power consumption		kW	3.04	3.06	3.17	1.49	1.51	1.49	1.40	1.21
Coefficient of performance ε (COP)			2.15	2.49	3.18	4.10	5.01	5.51	7.24	10.36
Min. heating output		kW	3.94	4.38	4.09	4.38	5.45	6.02	7.61	9.63

Operating point	**W**	**°C**	**45**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	6.95	8.06	9.52	9.87	10.28	13.75	15.16	17.24
Rated heating output		kW	6.95	8.06	9.52	5.79	7.17	7.79	9.64	11.99
Power consumption		kW	3.78	3.76	3.78	1.92	1.91	1.90	1.85	1.74
Coefficient of performance ε (COP)			1.84	2.14	2.52	3.02	3.75	4.09	5.20	6.91
Min. heating output		kW	3.84	4.75	5.79	5.10	5.09	5.61	7.22	8.50

Operating point	**W**	**°C**	**55**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		8.32	10.08	9.25	12.20	12.94	14.56	16.50
Rated heating output		kW		8.32	10.08	6.99	7.89	8.44	11.10	12.39
Power consumption		kW		4.63	4.54	2.70	2.67	2.64	2.78	2.45
Coefficient of performance ε (COP)				1.80	2.22	2.59	2.96	3.20	3.99	5.06
Min. heating output		kW		4.25	6.20	6.43	7.88	8.44	10.36	12.75

Operating point	**W**	**°C**	**60**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			9.46	8.56	11.14	11.67	13.94	16.08
Rated heating output		kW			9.46	6.95	8.32	8.96	10.72	13.12
Power consumption		kW			4.85	3.22	3.24	3.23	3.20	3.15
Coefficient of performance ε (COP)					1.95	2.16	2.57	2.77	3.35	4.17
Min. heating output		kW			6.29	6.94	8.34	8.95	10.71	13.12

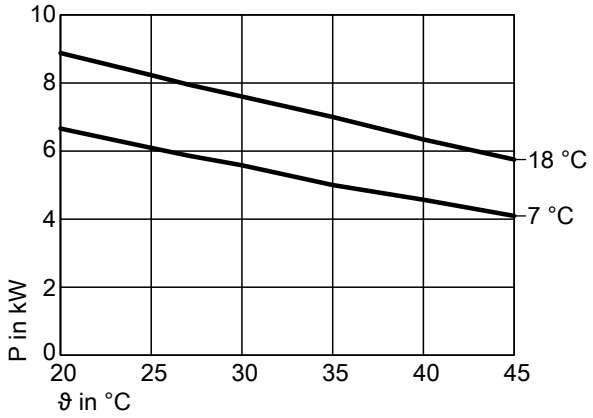
5831388

Curves (cont.)

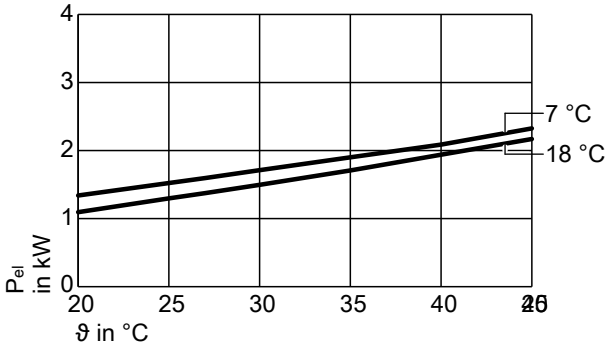
Cooling

■ **Vitocal 200-A**, type AWO-E-AC 201.A10
■ **Vitocal 222-A**, type AWOT-E-AC 221.A10

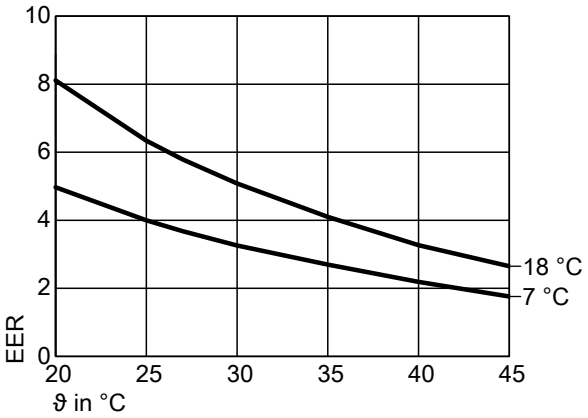
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

■ *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
■ *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**18**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	8.88	8.23	7.96	7.60	7.00	6.34	5.75
Power consumption		kW	1.09	1.30	1.37	1.50	1.71	1.94	2.17
Energy efficiency ratio EER			8.11	6.34	5.79	5.08	4.10	3.27	2.65

Operating point	**W**	**°C**	**7**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	6.66	6.09	5.87	5.58	5.00	4.57	4.09
Power consumption		kW	1.34	1.52	1.60	1.71	1.90	2.09	2.33
Energy efficiency ratio EER			4.97	4.00	3.68	3.26	2.70	2.19	1.76

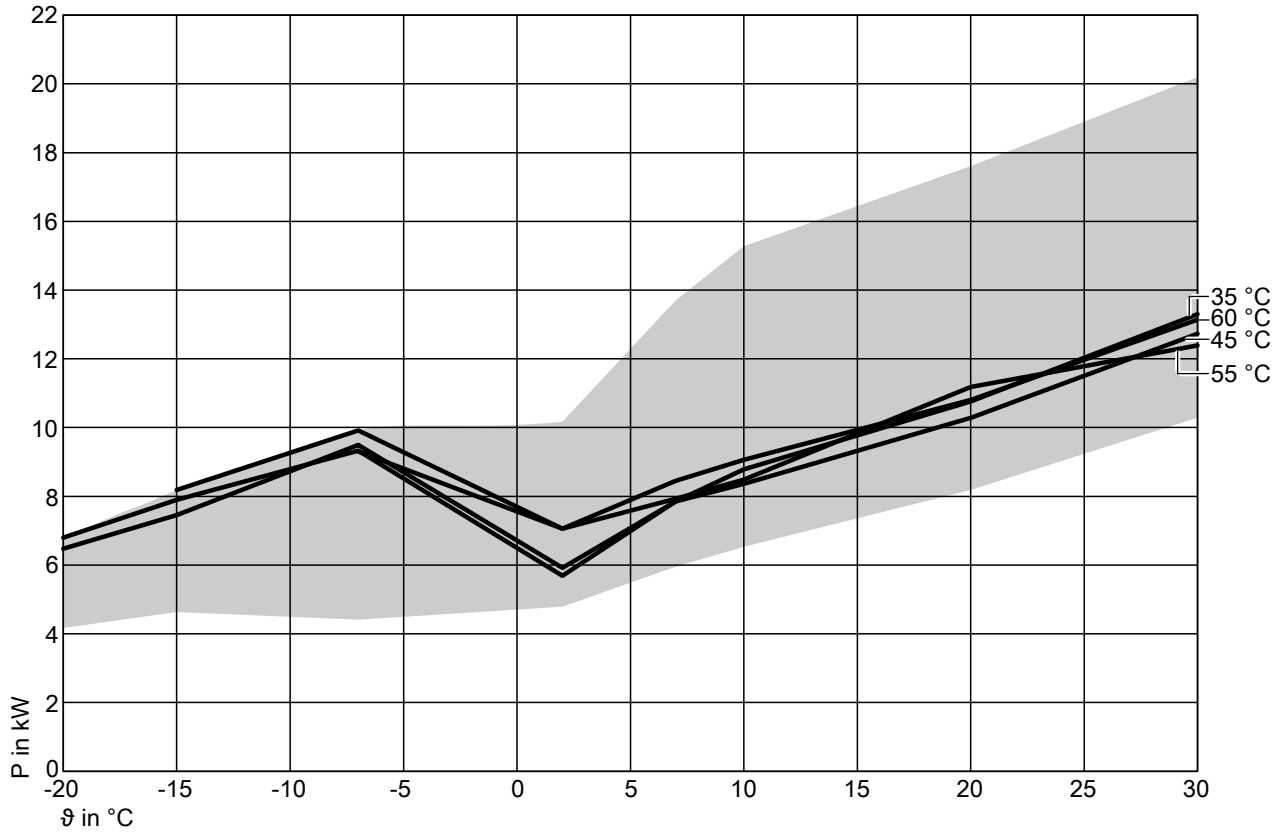
5.6 Performance diagrams, outdoor unit types 201.A13 and 221.A13, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A13
- AWO-M-E 201.A13
- AWO-M-E-AC 201.A13

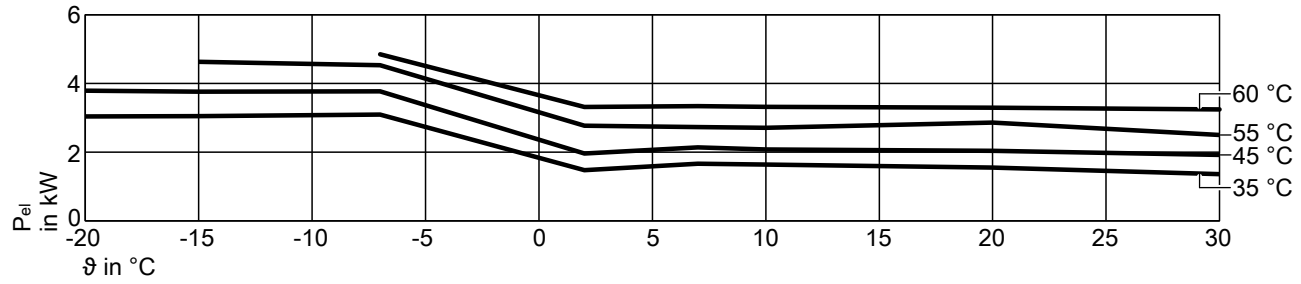
Vitocal 222-A, type
- AWOT-M-E 221.A13
- AWOT-M-E-AC 221.A13

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

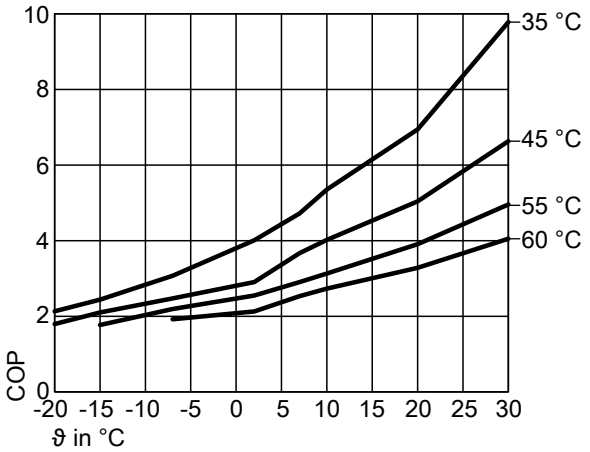
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**35**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	6.48	7.45	9.50	10.18	13.70	15.28	17.60	20.20
Rated heating output		kW	6.48	7.45	9.50	5.92	7.85	8.78	10.76	13.30
Power consumption		kW	3.04	3.05	3.09	1.48	1.66	1.64	1.55	1.36
Coefficient of performance ε (COP)			2.13	2.44	3.07	4.01	4.72	5.35	6.94	9.78
Min. heating output		kW	4.17	4.64	4.42	4.79	5.96	6.53	8.18	10.29

Operating point	**W**	**°C**	**45**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	6.80	7.90	9.33	9.96	10.37	14.67	16.20	18.48
Rated heating output		kW	6.80	7.90	9.33	5.69	7.85	8.36	10.28	12.73
Power consumption		kW	3.79	3.76	3.77	1.96	2.14	2.08	2.04	1.92
Coefficient of performance ε (COP)			1.79	2.10	2.47	2.90	3.67	4.02	5.04	6.63
Min. heating output		kW	4.00	5.04	6.11	6.74	5.58	6.14	7.78	9.79

Operating point	**W**	**°C**	**55**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		8.19	9.92	9.78	10.76	13.91	15.64	17.80
Rated heating output		kW		8.19	9.92	7.06	7.93	8.48	11.18	12.39
Power consumption		kW		4.63	4.53	2.77	2.73	2.71	2.86	2.50
Coefficient of performance ε (COP)				1.77	2.19	2.55	2.90	3.13	3.91	4.96
Min. heating output		kW		4.46	6.55	6.74	8.39	8.91	10.88	13.35

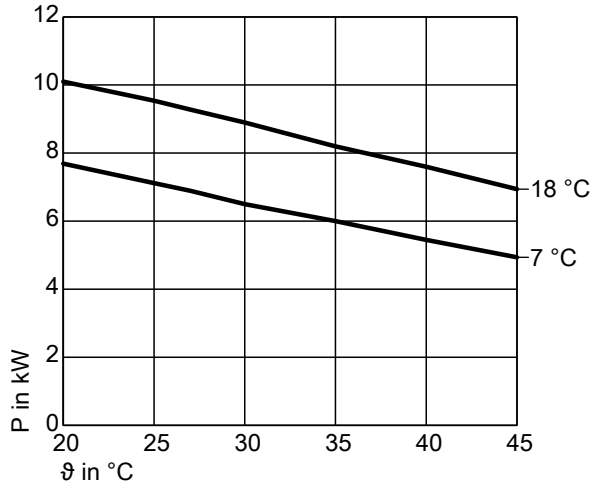
Operating point	**W**	**°C**	**60**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			9.31	9.41	11.68	12.24	14.55	16.20
Rated heating output		kW			9.31	7.06	8.45	9.06	10.81	13.14
Power consumption		kW			4.85	3.31	3.34	3.32	3.30	3.24
Coefficient of performance ε (COP)					1.92	2.13	2.53	2.73	3.28	4.05
Min. heating output		kW			6.65	7.28	8.80	9.38	11.24	13.73

Curves (cont.)

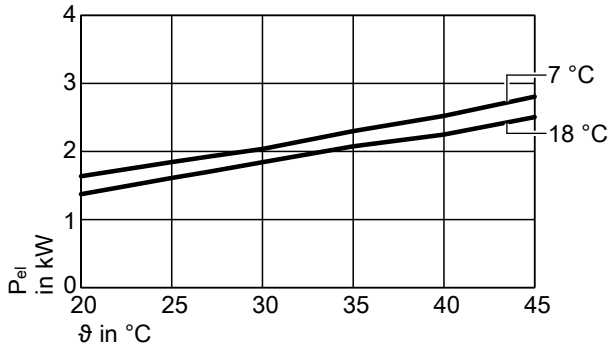
Cooling

■ **Vitocal 200-A**, type AWO-M-E-AC 201.A13
■ **Vitocal 222-A**, type AWOT-M-E-AC 221.A13

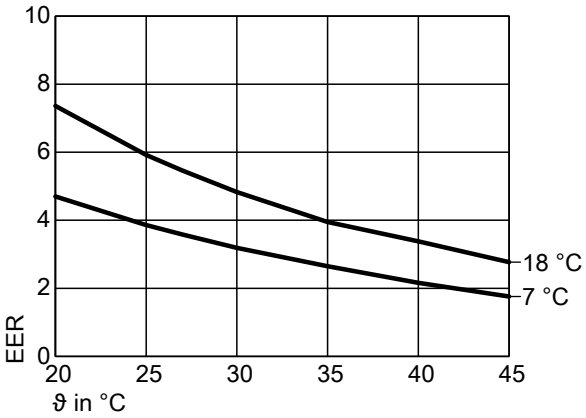
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

■ *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
■ *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**18**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	10.10	9.54	9.28	8.90	8.20	7.6	6.94
Power consumption		kW	1.37	1.61	1.70	1.84	2.08	2.25	2.50
Energy efficiency ratio EER			7.36	5.92	5.46	4.83	3.95	3.38	2.77

Operating point	**W**	**°C**	**7**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	7.69	7.12	6.89	6.50	6.00	5.45	4.94
Power consumption		kW	1.64	1.84	1.92	2.04	2.30	2.52	2.81
Energy efficiency ratio EER			4.70	3.86	3.58	3.19	2.65	2.16	1.76

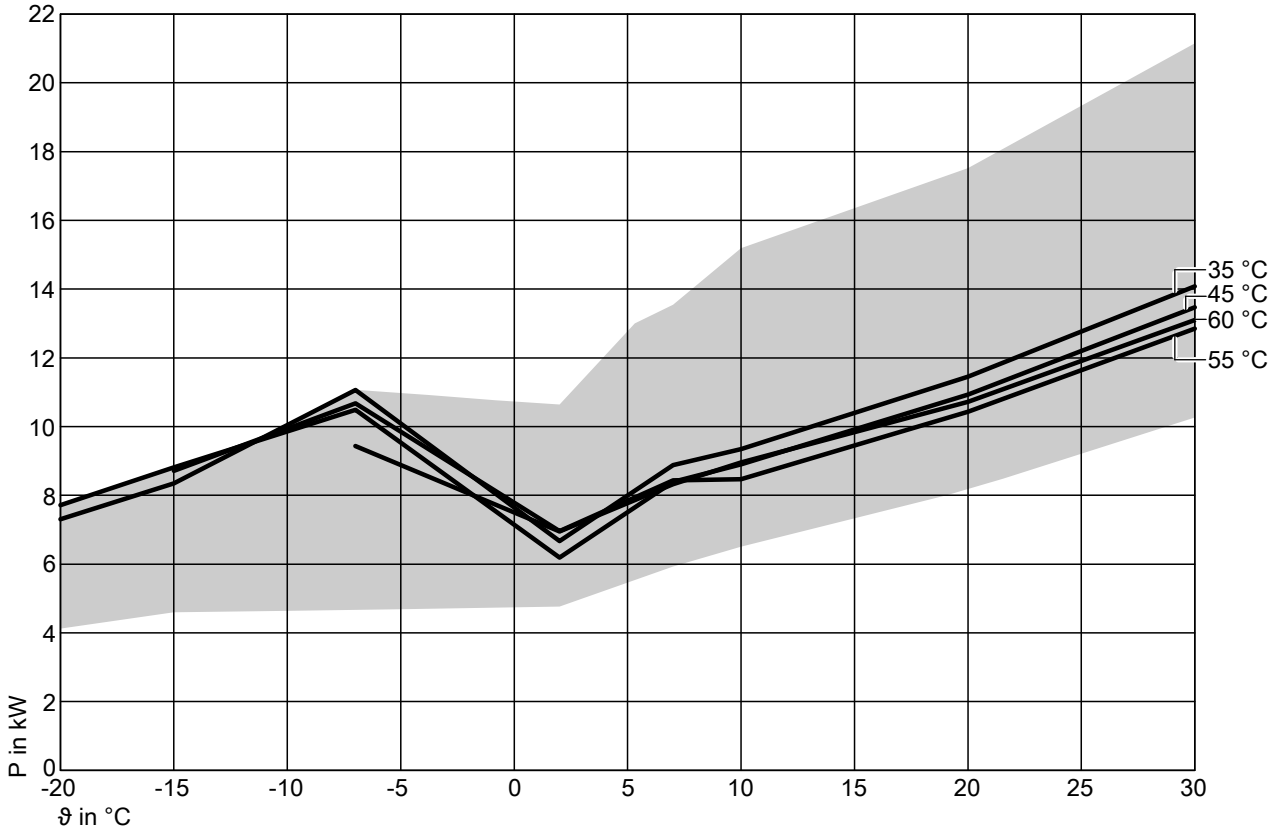
5.7 Performance diagrams, outdoor unit types 201.A13 and 221.A13, 400 V~

Heating

Vitocal 200-A, type
- AWO 201.A13
- AWO-E 201.A13
- AWO-E-AC 201.A13

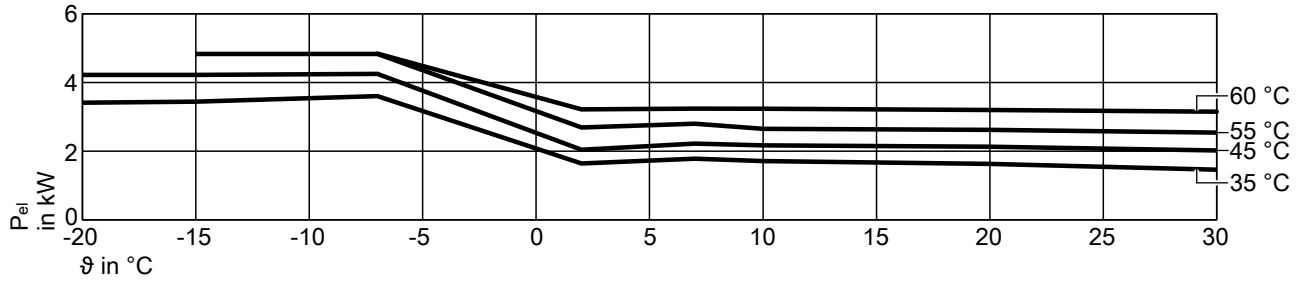
Vitocal 222-A, type
- AWOT-E 221.A13
- AWOT-E-AC 221.A13

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

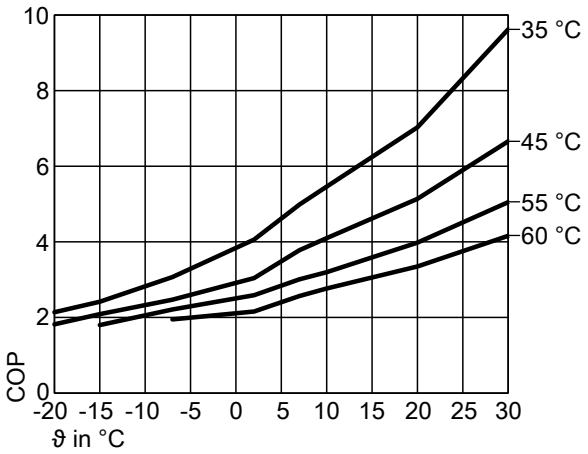
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**35**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	7.30	8.35	10.74	10.64	13.70	15.20	17.53	21.15
Rated heating output		kW	7.30	8.35	11.06	6.67	8.88	9.35	11.45	14.08
Power consumption		kW	3.41	3.44	3.60	1.64	1.78	1.71	1.63	1.46
Coefficient of performance ε (COP)			2.14	2.42	3.07	4.06	4.99	5.46	7.03	9.62
Min. heating output		kW	4.12	4.60	4.66	4.77	5.93	6.50	8.16	10.26

Operating point	**W**	**°C**	**45**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	7.71	8.81	10.49	10.42	10.90	14.58	16.11	18.38
Rated heating output		kW	7.71	8.81	10.49	6.19	8.39	8.90	10.93	13.47
Power consumption		kW	4.22	4.22	4.25	2.04	2.22	2.17	2.13	2.02
Coefficient of performance ε (COP)			1.82	2.09	2.47	3.04	3.78	4.10	5.14	6.66
Min. heating output		kW	4.03	4.96	6.05	5.47	5.54	6.10	7.74	9.75

Operating point	**W**	**°C**	**55**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		8.71	10.68	9.85	10.77	13.94	15.51	17.68
Rated heating output		kW		8.71	10.68	6.96	8.44	8.47	10.43	12.85
Power consumption		kW		4.83	4.83	2.69	2.80	2.65	2.62	2.54
Coefficient of performance ε (COP)				1.80	2.21	2.59	3.01	3.20	3.98	5.05
Min. heating output		kW		4.46	6.47	6.65	8.31	8.85	10.81	13.27

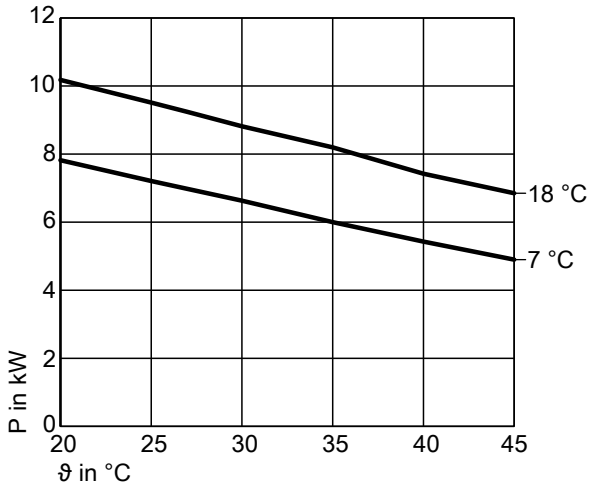
Operating point	**W**	**°C**	**60**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			9.44	9.22	11.84	12.45	14.81	17.28
Rated heating output		kW			9.44	6.95	8.32	8.96	10.72	13.10
Power consumption		kW			4.84	3.22	3.24	3.23	3.20	3.15
Coefficient of performance ε (COP)					1.95	2.16	2.57	2.77	3.35	4.16
Min. heating output		kW			6.57	7.15	8.69	9.33	11.14	13.62

Curves (cont.)

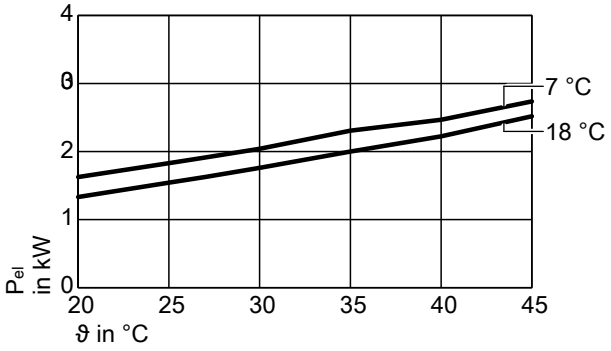
Cooling

■ **Vitocal 200-A**, type AWO-E-AC 201.A13
■ **Vitocal 222-A**, type AWOT-E-AC 221.A13

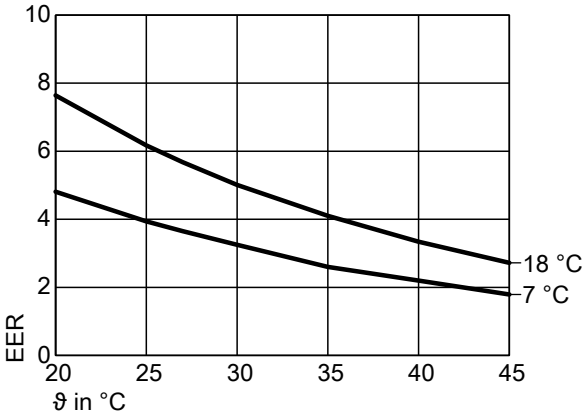
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

■ *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
■ *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**18**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	10.18	9.52	9.24	8.82	8.20	7.43	6.85
Power consumption		kW	1.33	1.54	1.63	1.76	2.00	2.22	2.52
Energy efficiency ratio EER			7.64	6.17	5.68	5.01	4.10	3.34	2.72

Operating point	**W**	**°C**	**7**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	7.82	7.21	6.98	6.63	6.00	5.43	4.90
Power consumption		kW	1.63	1.83	1.91	2.04	2.31	2.47	2.74
Energy efficiency ratio EER			4.81	3.94	3.65	3.25	2.60	2.20	1.79

5

5831388

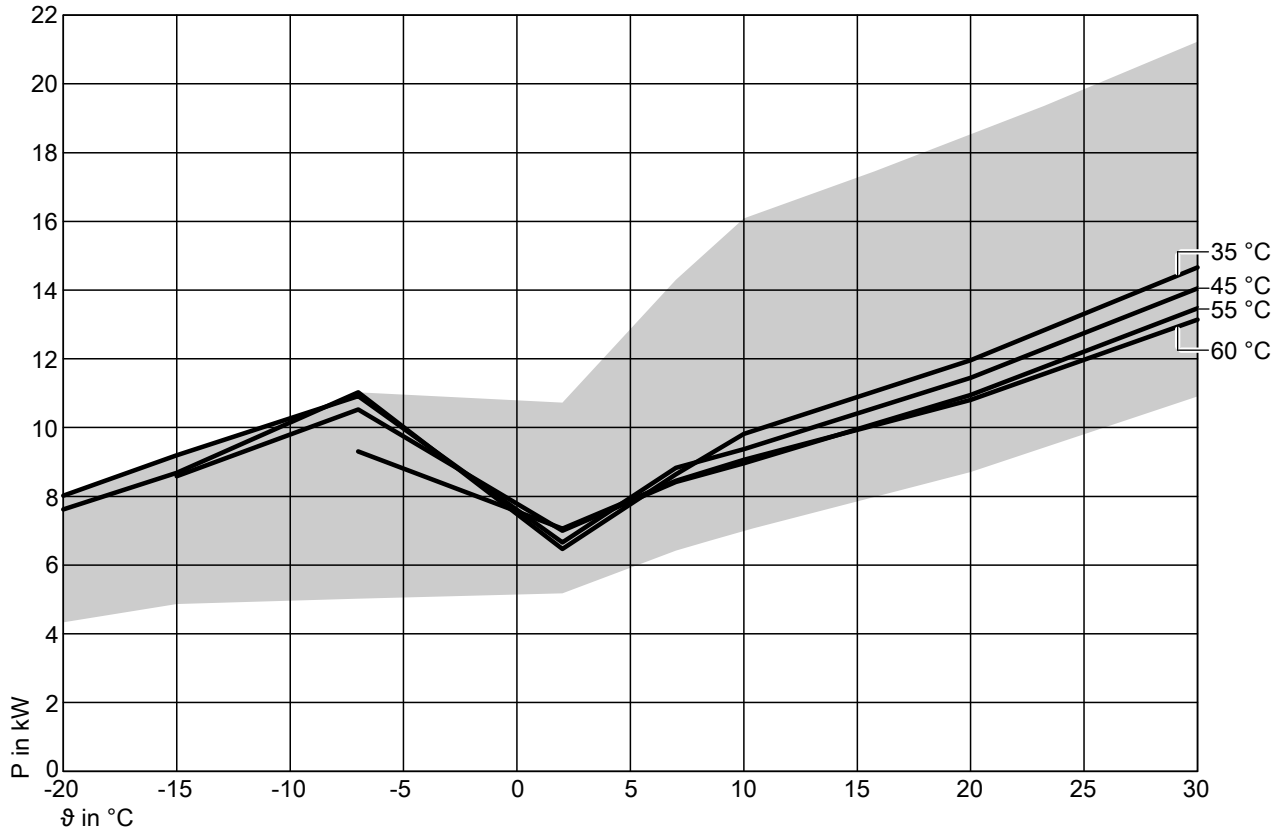
5.8 Performance diagrams, outdoor unit types 201.A16 and 221.A16, 230 V~

Heating

Vitocal 200-A, type
- AWO-M 201.A16
- AWO-M-E 201.A16
- AWO-M-E-AC 201.A16

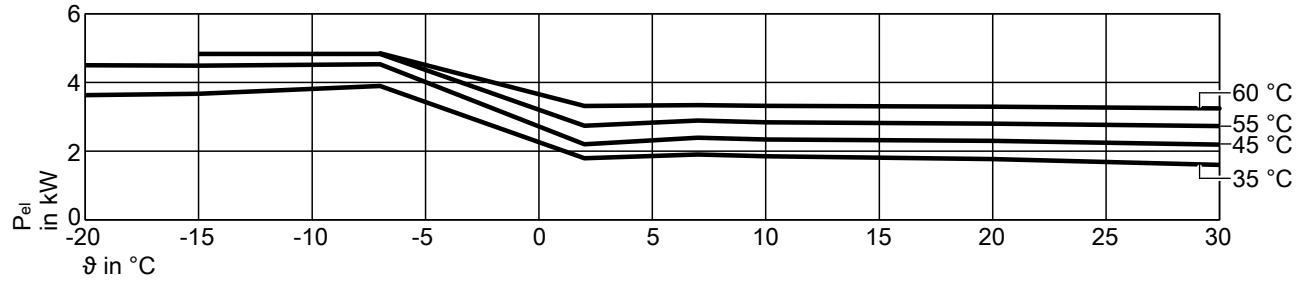
Vitocal 222-A, type
- AWOT-M-E 221.A16
- AWOT-M-E-AC 221.A16

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

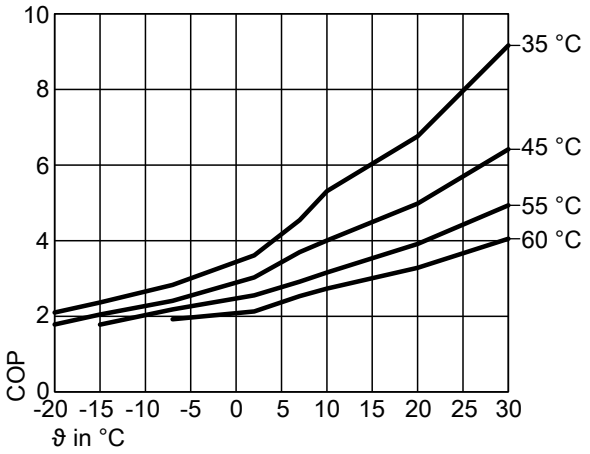
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**							
	A	**°C**	**35**							
			–20	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	7.62	8.68	11.03	10.72	14.30	16.09	18.46	21.23
Rated heating output		kW	7.62	8.68	11.03	6.47	8.64	9.82	11.96	14.66
Power consumption		kW	3.63	3.67	3.90	1.79	1.90	1.85	1.77	1.60
Coefficient of performance ε (COP)			2.10	2.37	2.83	3.61	4.54	5.31	6.76	9.16
Min. heating output		kW	4.34	4.87	5.02	5.18	6.42	7.00	8.71	10.91

Operating point	**W**	**°C**							
	A	**°C**	**45**							
			–20	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	8.02	9.19	10.91	10.52	10.99	15.49	17.12	19.59
Rated heating output		kW	8.02	9.19	10.91	6.66	8.83	9.37	11.45	14.05
Power consumption		kW	4.50	4.49	4.53	2.20	2.39	2.34	2.30	2.19
Coefficient of performance ε (COP)			1.78	2.05	2.41	3.03	3.69	4.00	4.98	6.42
Min. heating output		kW	4.18	5.27	6.36	5.88	6.03	6.62	8.29	10.40

Operating point	**W**	**°C**							
	A	**°C**	**55**							
			–20	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		8.59	10.53	10.32	11.10	14.63	16.56	18.95
Rated heating output		kW		8.59	10.53	7.00	8.42	8.96	10.95	13.47
Power consumption		kW		4.83	4.83	2.74	2.89	2.84	2.80	2.73
Coefficient of performance ε (COP)				1.78	2.18	2.55	2.91	3.15	3.91	4.93
Min. heating output		kW		4.66	6.85	6.96	8.78	9.28	11.33	13.87

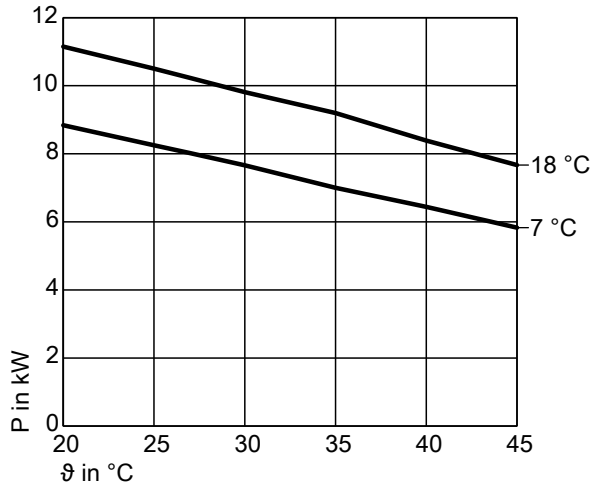
Operating point	**W**	**°C**							
	A	**°C**	**60**							
			–20	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			9.31	9.98	12.44	13.10	15.51	17.40
Rated heating output		kW			9.31	7.06	8.45	9.06	10.81	13.14
Power consumption		kW			4.85	3.31	3.34	3.32	3.30	3.24
Coefficient of performance ε (COP)					1.92	2.13	2.53	2.73	3.28	4.05
Min. heating output		kW			6.94	7.51	9.16	9.82	11.66	14.23

5831388

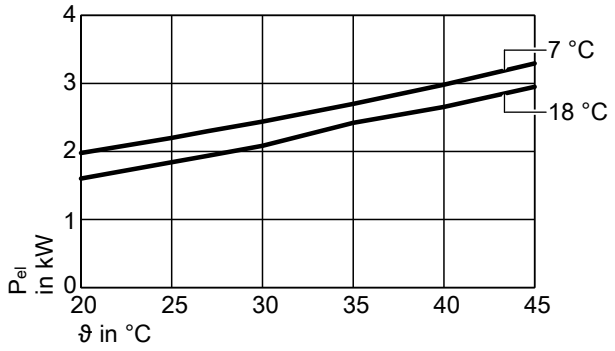
Cooling

■ **Vitocal 200-A**, type AWO-M-E-AC 201.A16
■ **Vitocal 222-A**, type AWOT-M-E-AC 221.A16

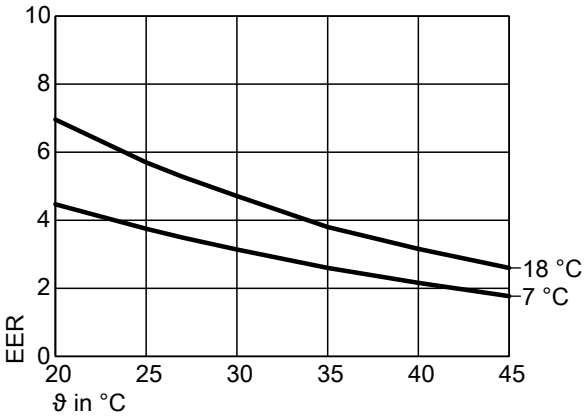
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note
■ *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
■ *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**18**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	11.15	10.50	10.23	9.81	9.20	8.39	7.67
Power consumption		kW	1.60	1.84	1.94	2.08	2.42	2.66	2.95
Energy efficiency ratio EER			6.96	5.70	5.28	4.71	3.80	3.16	2.60

Operating point	**W**	**°C**	**7**						
	A	**°C**	**20**	**25**	**27**	**30**	**35**	**40**	**45**
Cooling capacity		kW	8.84	8.25	8.02	7.66	7.00	6.44	5.83
Power consumption		kW	1.98	2.20	2.30	2.44	2.70	2.98	3.29
Energy efficiency ratio EER			4.47	3.75	3.49	3.14	2.60	2.16	1.77

5831388

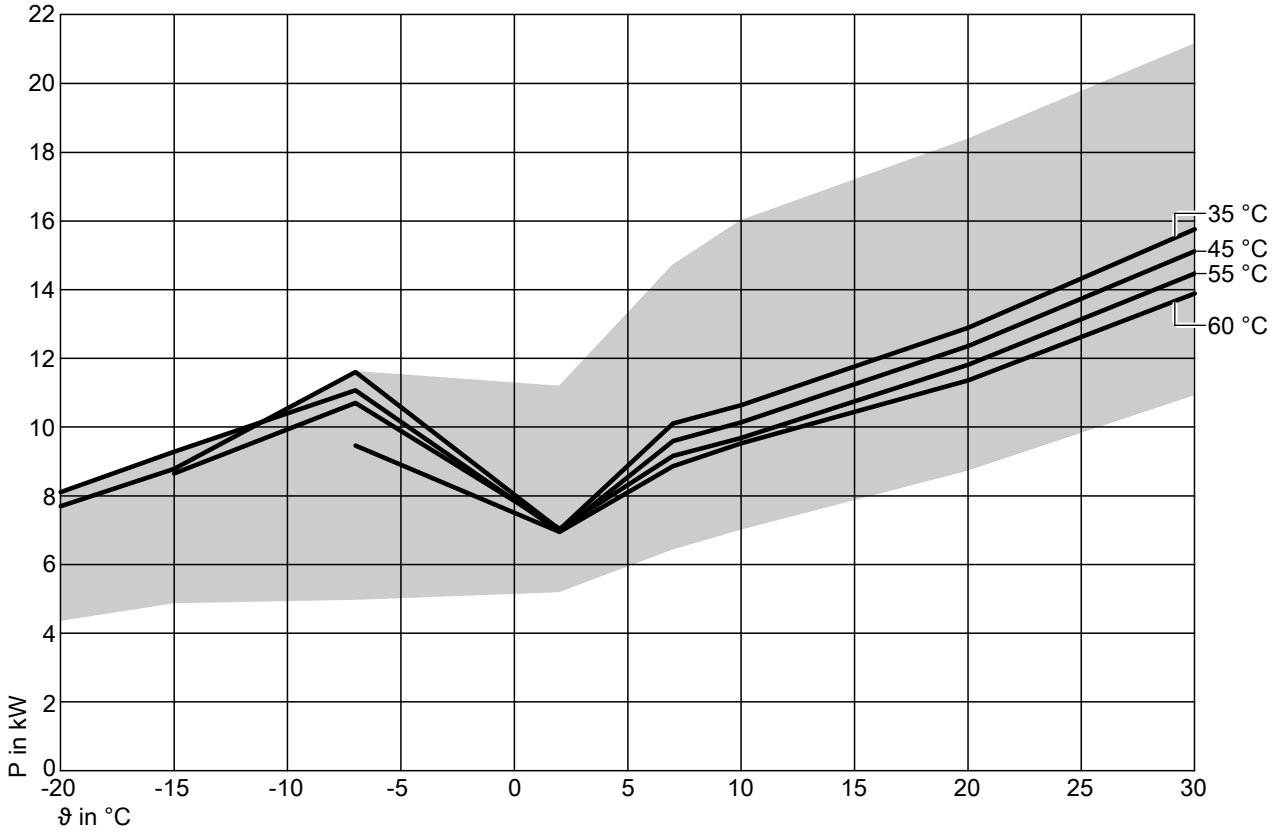
5.9 Performance diagrams, outdoor unit types 201.A16 and 221.A16, 400 V~

Heating

Vitocal 200-A, type
- AWO 201.A16
- AWO-E 201.A16
- AWO-E-AC 201.A16

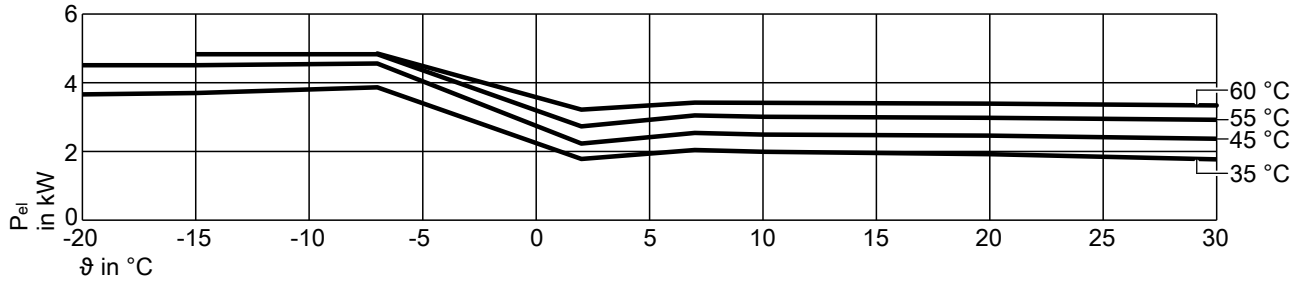
Vitocal 222-A, type
- AWOT-E 221.A16
- AWOT-E-AC 221.A16

Heating output at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



Possible output range

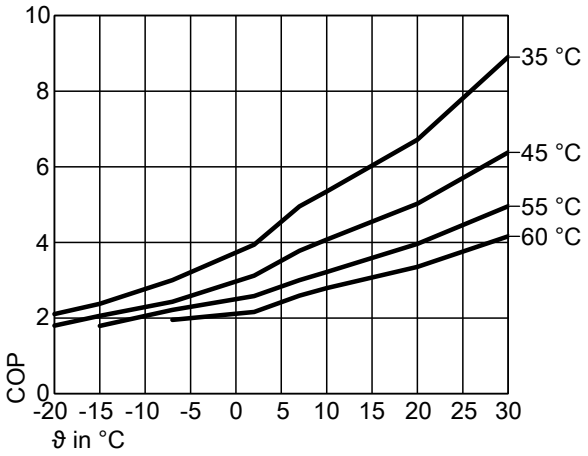
Power consumption at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



5831388

Curves (cont.)

Coefficient of performance COP at flow temperatures of 35 °C, 45 °C, 55 °C, 60 °C



ϑ Air intake temperature
P Heating output
P_{el} Power consumption
COP Coefficient of performance

Note

- *The COP data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**	**35**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	7.70	8.78	11.60	11.18	14.70	16.00	18.38	21.15
Rated heating output		kW	7.70	8.78	11.60	7.02	10.11	10.64	12.89	15.76
Power consumption		kW	3.66	3.70	3.87	1.78	2.04	1.99	1.92	1.77
Coefficient of performance ε (COP)			2.10	2.37	3.00	3.94	4.95	5.35	6.71	8.90
Min. heating output		kW	4.31	4.83	4.96	5.15	6.39	6.96	8.68	10.88

Operating point	**W**	**°C**	**45**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW	8.11	9.28	11.07	10.95	11.67	15.36	17.01	19.50
Rated heating output		kW	8.11	9.28	11.07	6.96	9.59	10.14	12.36	15.12
Power consumption		kW	4.51	4.51	4.56	2.23	2.54	2.49	2.46	2.37
Coefficient of performance ε (COP)			1.80	2.06	2.43	3.12	3.78	4.07	5.02	6.38
Min. heating output		kW	4.18	5.17	6.30	5.83	5.99	6.58	8.25	10.36

Operating point	**W**	**°C**	**55**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW		8.65	10.70	10.36	11.16	14.73	16.44	18.82
Rated heating output		kW		8.65	10.70	7.04	9.16	9.68	11.81	14.47
Power consumption		kW		4.83	4.83	2.73	3.05	3.01	2.98	2.92
Coefficient of performance ε (COP)				1.79	2.22	2.58	3.00	3.22	3.96	4.96
Min. heating output		kW		4.56	6.60	6.89	8.70	9.20	11.25	13.79

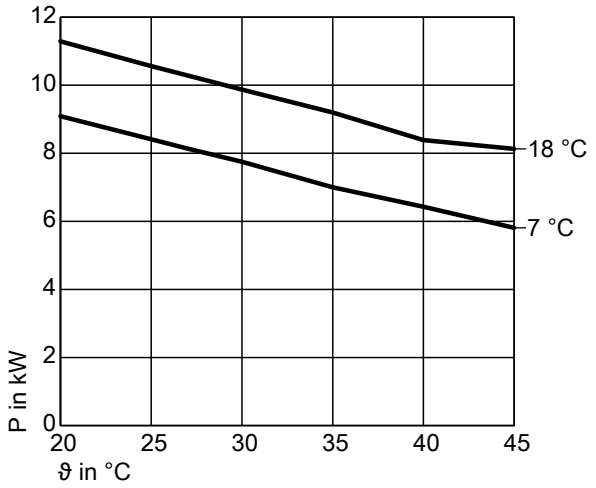
Operating point	**W**	**°C**	**60**							
	A	**°C**	**–20**	**–15**	**–7**	**2**	**7**	**10**	**20**	**30**
Max. heating output		kW			9.24	9.80	12.69	13.32	15.84	18.45
Rated heating output		kW			9.46	6.95	8.86	9.53	11.36	13.89
Power consumption		kW			4.85	3.22	3.42	3.42	3.39	3.34
Coefficient of performance ε (COP)					1.95	2.16	2.59	2.79	3.35	4.16
Min. heating output		kW			6.84	7.36	9.13	9.70	11.57	14.12

Curves (cont.)

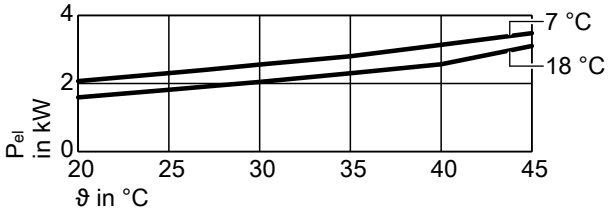
Cooling

- **Vitocal 200-A**, type AWO-E-AC 201.A16
- **Vitocal 222-A**, type AWOT-E-AC 221.A16

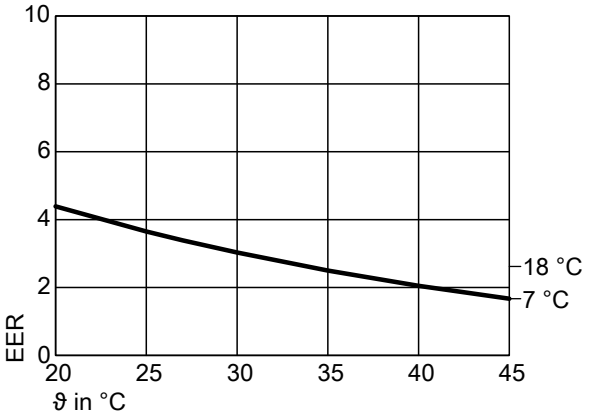
Cooling capacity at flow temperatures 18 °C, 7 °C



Power consumption for cooling at flow temperatures 18 °C, 7 °C



Performance factor EER at flow temperatures of 18 °C, 7 °C



ϑ Air intake temperature
P Cooling capacity
P_{el} Power consumption
EER Coefficient of performance

Note

- *The EER data in the tables and diagrams was calculated with reference to EN 14511.*
- *Performance characteristics apply to new appliances with clean plate heat exchangers.*

Operating point	**W**	**°C**							
	A	**°C**	**20**	**25**	**27**	**18** **30**	**35**	**40**	**45**
Cooling capacity		kW	11.29	10.56	10.29	9.87	9.20	8.39	8.13
Power consumption		kW	1.59	1.81	1.91	2.05	2.30	2.57	3.10
Energy efficiency ratio EER			7.09	5.82	5.39	4.82	4.00	3.27	2.62

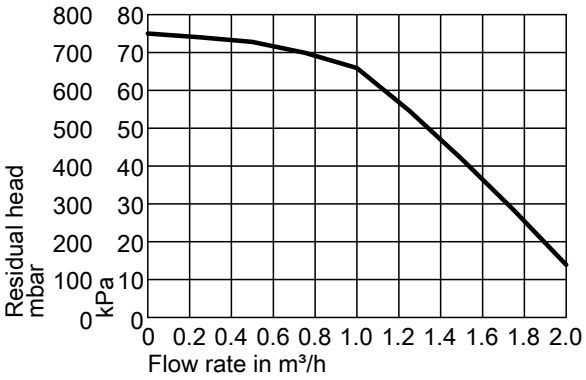
Operating point	**W**	**°C**							
	A	**°C**	**20**	**25**	**27**	**7** **30**	**35**	**40**	**45**
Cooling capacity		kW	9.09	8.41	8.14	7.75	7.00	6.43	5.81
Power consumption		kW	2.07	2.30	2.40	2.56	2.80	3.14	3.48
Energy efficiency ratio EER			4.39	3.65	3.39	3.03	2.50	2.05	1.67

5.10 Residual heads with the integral circulation pump

Indoor unit Vitocal 200-A and Vitocal 222-A, types 201.A04 to 201.A08 and 221.A04 to 221.A08, 230 V~

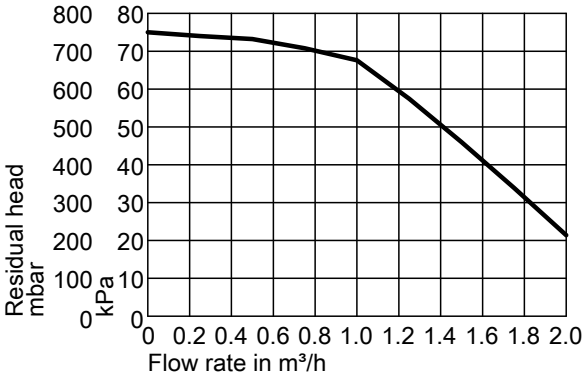
Vitocal 200-A, type
- AWO-M 201.A04
- AWO-M-E 201.A04
- AWO-M-E-AC 201.A04
- AWO-M 201.A06
- AWO-M-E 201.A06
- AWO-M-E-AC 201.A06
- AWO-M 201.A08
- AWO-M-E 201.A08
- AWO-M-E-AC 201.A08

Vitocal 222-A, type
- AWOT-M-E 221.A04
- AWOT-M-E-AC 221.A04
- AWOT-M-E 221.A06
- AWOT-M-E-AC 221.A06
- AWOT-M-E 221.A08
- AWOT-M-E-AC 221.A08



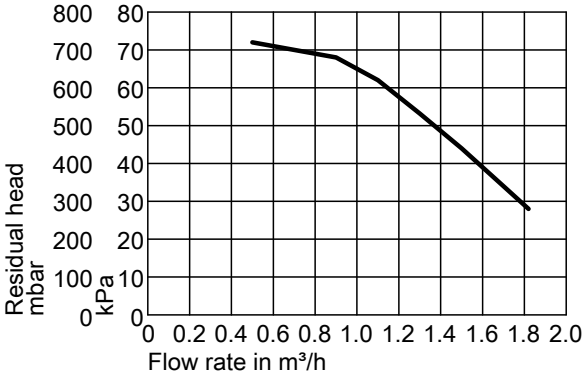
Indoor unit Vitocal 200-A, types 201.A10 to 201.A16, 230 V~ and 400 V~

Vitocal 200-A, type
- AWO 201.A10
- AWO-E 201.A10
- AWO-E-AC 201.A10
- AWO-M 201.A10
- AWO-M-E 201.A10
- AWO-M-E-AC 201.A10
- AWO 201.A13
- AWO-E 201.A13
- AWO-E-AC 201.A13
- AWO-M 201.A13
- AWO-M-E 201.A13
- AWO-M-E-AC 201.A13
- AWO 201.A16
- AWO-E 201.A16
- AWO-E-AC 201.A16
- AWO-M 201.A16
- AWO-M-E 201.A16
- AWO-M-E-AC 201.A16



Indoor unit Vitocal 222-A, types 221.A10 to 221.A16, 230 V~ and 400 V~

Vitocal 222-A, type
- AWOT-E 221.A10
- AWOT-E-AC 221.A10
- AWOT-M-E 221.A10
- AWOT-M-E-AC 221.A10
- AWOT-E 221.A13
- AWOT-E-AC 221.A13
- AWOT-M-E 221.A13
- AWOT-M-E-AC 221.A13
- AWOT-E 221.A16
- AWOT-E-AC 221.A16
- AWOT-M-E 221.A16
- AWOT-M-E-AC 221.A16



6.1 Overview

Accessories	Part no.	Vitocal 200-A, type		Vitocal 222-A, type	
		AWO(-M) 201.A AWO(-M)-E 201.A	AWO(-M)-E-AC 201.A	AWOT(-M)-E 221.A	AWOT(-M)-E-AC 221.A
Ventilation unit: See from page 58.					
Ventilation units and accessories: See "Vitovent" technical guides		X	X	X	X
Heating water buffer cylinder: See from page 58.					
Vitocell 100-W, type SVPA, colour: White	Z015310	X	X	X	X
Vitocell 100-E, type SVPA, colour: Black	ZK03801			X	X
Heating circuit (secondary circuit): See from page 60.					
Ball valve with filter G 1¼	ZK03206	X	X	X	X
Hydraulic connection set					
– Up to 14.5 kW, length 5 m	7521273	X	X	X	X
– Up to 14.5 kW, length 10 m	7521274	X	X	X	X
– Up to 14.5 kW, length 15 m	7521275	X	X	X	X
– Up to 14.5 kW, length 20 m	7521276	X	X	X	X
Connection set					
– Floorstanding installation	ZK02938	X	X	X	X
– Wall mounting	ZK02939	X	X	X	X
Hydraulic connection accessories: See from page 61.					
3-way diverter valve	ZK02928	X	X		
Instantaneous heating water heater	ZK04065	X*11			
Heating circuit hydraulic connection set					
– For surface mounting, for upward connection	ZK02960			X	X
– For surface mounting to the left or right	ZK02959			X	X
Installation kit with mixer	ZK02958			X	X*12
Divicon heating circuit distributor: See from page 63. ***Note*** *The Divicon heating circuit distributor is not suitable for heating circuits also used for cooling mode.*					
Without mixer for heating circuit 1 (A1/HC1)					
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 20 - ¾	7521287	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 25 - 1	7521288	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA Opt. 25/7.5, DN 32 - 1¼	ZK01831	X	X	X	X
With mixer for heating circuit 2 (M2/HC2)					
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 20 - ¾	ZK00967	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 25 - 1	ZK00968	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA Opt. 25/7.5, DN 32 - 1¼	ZK01825	X	X	X	X
With mixer for heating circuit 3 (M3/HC3)					
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 20 - ¾	7521285	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA 25/6, DN 25 - 1	7521286	X	X	X	X
– With high efficiency circulation pump Wilo Yonos PARA Opt. 25/7.5, DN 32 - 1¼	ZK01830	X	X	X	X
Mixer extension kits: See control unit accessories on page 135.					
Bypass valve	7464889	X	X	X	X
Wall mounting bracket for individual Divicon	7465894	X	X	X	X
Manifold for 2 Divicons					
– DN 20 - ¾/DN 25 - 1	7460638	X	X	X	X
– DN 32 - 1¼	7466337	X	X	X	X
Manifold for 3 Divicons					
– DN 20 - ¾/DN 25 - 1	7460643	X	X	X	X
– DN 32 - 1¼	7466340	X	X	X	X
Wall mounting bracket for manifold	7465439	X	X	X	X

*11 *For type AWO(-M) 201.A only*

*12 *In conjunction with the installation kit with mixer, central cooling is possible only via heating/cooling circuit A1/HC1.*

Installation accessories (cont.)

Accessories	Part no.	Vitocal 200-A, type		Vitocal 222-A, type	
		AWO(-M) 201.A AWO(-M)-E 201.A	AWO(-M)-E-AC 201.A	AWOT(-M)-E 221.A	AWOT(-M)-E-AC 221.A
DHW heating, general: See from page 69.					
Safety assembly to DIN 1988	7180662	X	X	X	X
DHW heating with integral DHW cylinder: See from page 69					
Impressed current anode	Z004247			X	X
DHW heating with Vitocell 100-V, type CVWA (300 l/390 l/500 l) and Vitocell 100-W, type CVWA (300 l): See from page 69.					
Vitocell 100-V, type CVWA, 300 l, colour: Vitosilver	Z016795	X	X		
Vitocell 100-W, type CVWA, 300 l, colour: White	Z017719	X	X		
Vitocell 100-V, type CVWA, 390 l, colour: Vitosilver	Z016796	X	X		
Vitocell 100-V, type CVWA, 500 l, colour: Vitosilver	Z016796	X	X		
Immersion heater EHE					
– Cylinder capacity 300 l/390 l/500 l, installation in upper section	Z012684	X	X		
– Cylinder capacity 300 l/390 l, installation in lower section	Z016798	X	X		
– Cylinder capacity of 500 l, installation in lower section	Z016799	X	X		
Solar heat exchanger set for a cylinder volume of 390 l/500 l	7186663	X	X		
Impressed current anode					
– Cylinder capacity 300 l	7265008	X	X		
– Cylinder capacity 390 l	Z004247	X	X	X	X
DHW heating with Vitocell 100-V, type CVAA (300 l) and Vitocell 100-W, type CVAA (300 l): See from page 76.					
Vitocell 100-V, type CVAA, 300 l, colour: Vitosilver	Z013672	A04 to A08	A04 to A08		
Vitocell 100-W, type CVAA, 300 l, colour: White	Z013673	A04 to A08	A04 to A08		
Immersion heater EHE, installation in lower section	Z012676	X	X		
Impressed current anode	7265008	X	X		
DHW heating with Vitocell 100-B, type CVBB (300 l) and Vitocell 100-W, type CVBB (300 l): See from page 82.					
Vitocell 100-B, type CVBB, 300 l, colour Vitosilver	Z013674	A04 to A08	A04 to A08		
Vitocell 100-W, type CVBB, 300 l, colour: White	Z013675	A04 to A08	A04 to A08		
Immersion heater EHE, installation in lower section	Z012676	X	X		
Impressed current anode	7265008	X	X		
Solar accessories: See from page 90.					
Solar heat exchanger set (Divicon)	ZK03798			X	X
Solar Divicon, type PS 10	Z017690	X	X	X	X
High limit safety cut-out for solar thermal system	7506168	X	X	X	X
Heat transfer medium "Tyfocor LS"	7159727	X	X	X	X
Filling station	7188625	X	X	X	X
Cooling accessories: See from page 93.					
Contact humidistat 230 V	7452646		X		X
Frost stat	7179164		X		X
High efficiency circulation pump Wilo Yonos PICO plus 30/1-6	7783570		X		X
3-way diverter valve					
– Connection G 1	ZK01343		X		X
– Connection G 1½	ZK01344		X		X
Contact temperature sensor	7426463		X		X
Room temperature sensor	7438537		X		X
Supports for outdoor unit: See from page 96.					
Support for floorstanding installation	ZK02929	X	X	X	X
Bracket set for wall mounting	ZK02930	X	X	X	X
Miscellaneous: See from page 97.					
Condensate pan drainage set	ZK04096	X	X	X	X
Electric ribbon heater, length 1.2 m	ZK04097	X	X	X	X
Electric ribbon heater, length 2.5 m	ZK04098	X	X	X	X
Carrying handles for outdoor unit	ZK02931	X	X	X	X
Cap set	ZK02933	X	X	X	X
Special cleaner	7249305	X	X	X	X
Platform for unfinished floors	7417925			X	X
Drain outlet kit	7176014			X	X

6.2 Ventilation unit

Vitovent ventilation units

Vitovent mechanical ventilation systems with central ventilation unit can be fully controlled via the heat pump control unit. The heat pump control unit has the entire range of functions required for operation, control parameter configuration and diagnostics of the connected ventilation unit.

Note
For detailed information on designing a mechanical ventilation system with a central ventilation unit: See technical guide "Central mechanical ventilation systems with heat recovery".

Vitovent	Type	Part no.	Countercurrent heat exchanger	Enthalpy heat exchanger	Max. air flow rate in m^3/h	Max. residential unit area in m^2
200-C	H11S A200	**Z014599** (L) **Z015391** (R)	X		200	120
	H11E A200	**Z014584** (L) **Z015392** (R)		X	200	120
300-W	H32S B300	**Z014589**	X		300	230
	H32E B300	**Z014582**		X	300	230
	H32S B400	**Z014590**	X		400	370
	H32E B400	**Z014583**		X	400	370
300-C	H32S B150	**Z014591**	X		150	90
300-F	H32S B280	**Z011432** (w) **Z012121** (s)	X		280	180
	H32E C280	**Z014585** (w) **Z014586** (s)		X	280	180

(L) Supply air connection, left
(R) Supply air connection, right

(w) Colour: White
(s) Colour: Vitosilver

6.3 Heating water buffer cylinder

Vitocell 100-W, type SVPA, white

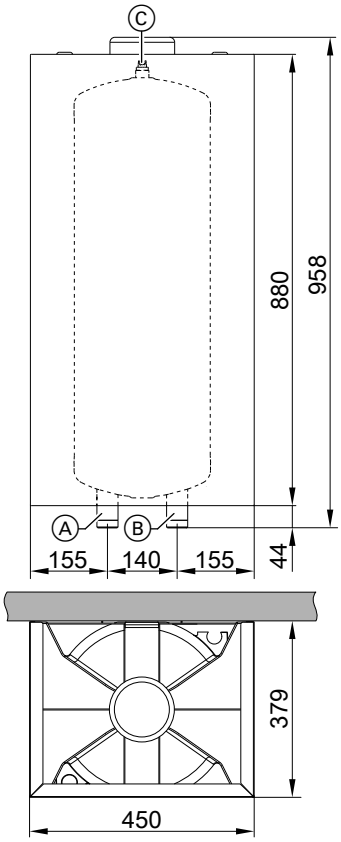
Part no. Z015310
Colour: White

Wall mounted heating water buffer cylinder for installation in the secondary circuit return
- For storing heating water in conjunction with heat pumps with up to 17 kW heating output
- For ensuring the minimum system volume

Standard delivery:
- Heating water buffer cylinder with EPS thermal insulation and sheet steel casing
- Wall mounting bracket
- Overflow valve DN 25, R 1

Specification

Cylinder capacity (AT: Actual water capacity)	**l**	**46**
Max. flow temperature	°C	95
Max. operating pressure	bar	3
	MPa	0.3
Weight	kg	18
Connections (male thread)		
Heating water flow and return	G	1¼
Standby heat loss	kWh/24 h	0.94
Energy efficiency class		B



Ⓐ Heating water flow or heating water return R 1, as required
Ⓑ Heating water return or heating water flow R 1, as required
Ⓒ Air vent valve

Vitocell 100-E, type SVPA, colour: Black

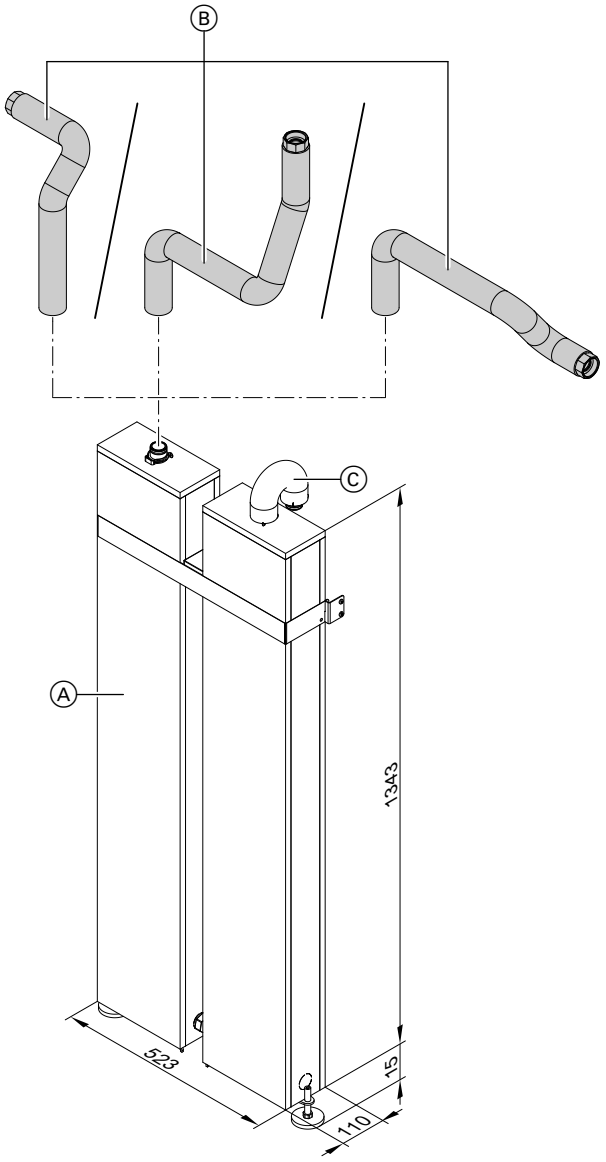
Part no. ZK03801

Floorstanding heating water buffer cylinder for installation in the secondary circuit return
- For storing heating water in conjunction with heat pump compact appliances
- For ensuring the minimum system volume
- For installation at the back of the heat pump compact appliance

Standard delivery:
- Heating water buffer cylinder with thermal insulation
- Mounting bracket for fixing to the back of the heat pump compact appliance
- Height-adjustable feet
- Connection pipes to fit heating circuit hydraulic connection set for surface mounting
- Overflow valve DN 20, R ¾

Specification

Cylinder capacity (AT: Actual water capacity)	**l**	**40**
Max. flow temperature	°C	60
Max. operating pressure	bar	3
	MPa	0.3
Weight	kg	52



Ⓐ Vitocell 100-E, type SVPA
Ⓑ Secondary circuit return in conjunction with heating circuit hydraulic connection set, for surface mounting to right/left or above
Ⓒ Connection line for connecting the heating water return to the heat pump

6.4 Heating circuit (secondary circuit)

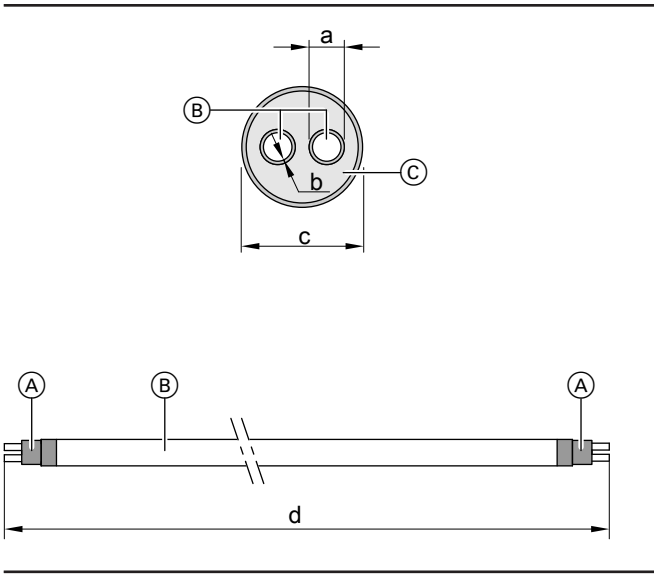
Ball valve with filter (G 1¼)

Part no. ZK03206

- Ball valve with integral stainless steel water filter
- For installation in the heating water return and protection of the condenser against contamination

Hydraulic connection set

For hydraulic connection of the outdoor unit to the indoor unit, flexible routing underground:
- 4 adaptors
- 2 rubber end collars Ⓐ
- 1 roll of route warning tape



Ⓐ End collar
Ⓑ Flow/return line made of polybutene
Ⓒ Outer pipe, thermally insulated

Flow/return lines Ⓑ		2 x DN 32
– Dim. a: External ∅		40 mm
– Dim. b: Wall thickness		3.7 mm
– Adaptors		4 x DA 40 to R 1¼
Outer pipe Ⓒ		
– Dim. c: External ∅		160 mm
Number of end collars Ⓐ		2
Dim. d: Line length		
– 5 m	Part no.	**7521273**
– 10 m	Part no.	**7521274**
– 15 m	Part no.	**7521275**
– 20 m	Part no.	**7521276**

- The flow and return lines are made of polybutene to EN ISO 15876 with a pressure rating of 8 bar at 95 °C. To differentiate between the two pipes, one is marked with a stripe.
- The thermal insulation is made from longitudinally watertight polyolefin foam, which is connected to the polyethylene (HDPE) outer pipe.
- The pipe is fixed directly in the brickwork with expanding mortar or concrete (no other accessories required).
- The flow and return lines can be trimmed.

Floorstanding installation connection set

Part no. ZK02938
Connection set for connecting the outdoor unit to the hydraulic connection sets

Components:
- 2 stainless steel DN 32 corrugated pipes, 600 mm long, with 1¼ brass locking nut and thermal insulation, 42 x 32 mm
- Thermal insulation, 54 x 31 mm, 200 mm long
- Brass twin connector 1½ male/1¼ male
- Brass reducer 1½ male to 1¼ female
- Adhesive tape: Length 1000 mm, width 50 mm

Wall mounting connection set

Part no. ZK02939
For hydraulic connection of the outdoor unit to the heating system

Components:
- Wall duct DN 150, 750 mm long
- Sealing insert with entries for 2 x copper pipes ∅ 28 mm and 3 x electric cables 1 mm to 18 mm (copper pipe not included)
- Cap with entries for 2 x copper pipes ∅ 28 mm and 3 x electric cables of varying diameters
- Thermal insulation 28 x 24 mm, 200 mm long for the copper pipes in the wall duct
- Thermal insulation, 54 x 31 mm, 200 mm long
- Adhesive tape: Length 1000 mm, width 50 mm

6.5 Vitocal 222-A: Hydraulic connection accessories

3-way diverter valve

Part no. ZK02928
For installation in the return in cascade applications

Installation accessories (cont.)

Instantaneous heating water heater

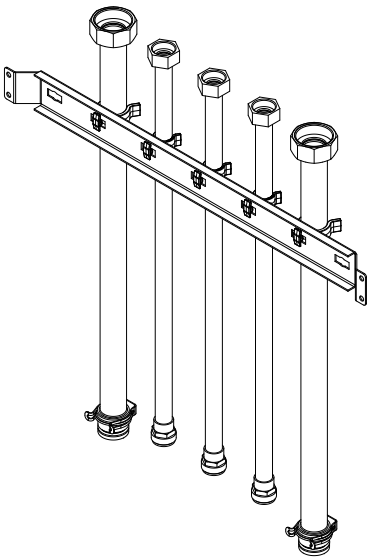
Part no. ZK04065

- For installation in the indoor unit
- 3-stage heating output 3, 6 and 9 kW

Heating circuit hydraulic connection set for surface mounting, for upward connection

Part no. ZK02960

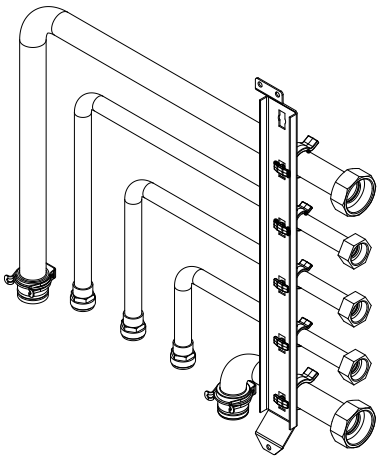
- Thermally insulated heating water flow and heating water return line G 1¼
- Thermally insulated cold water and DHW line G ¾
- Thermally insulated DHW circulation pipe G ¾



Heating circuit hydraulic connection set for surface mounting, for connection to left or right

Part no. ZK02959

- Thermally insulated heating water flow and heating water return line G 1¼ with 90° bend
- Thermally insulated cold water and DHW line G ¾ with 90° bend
- Thermally DHW circulation pipe G ¾ with 90° bend



Installation kit with mixer

Part no. ZK02958

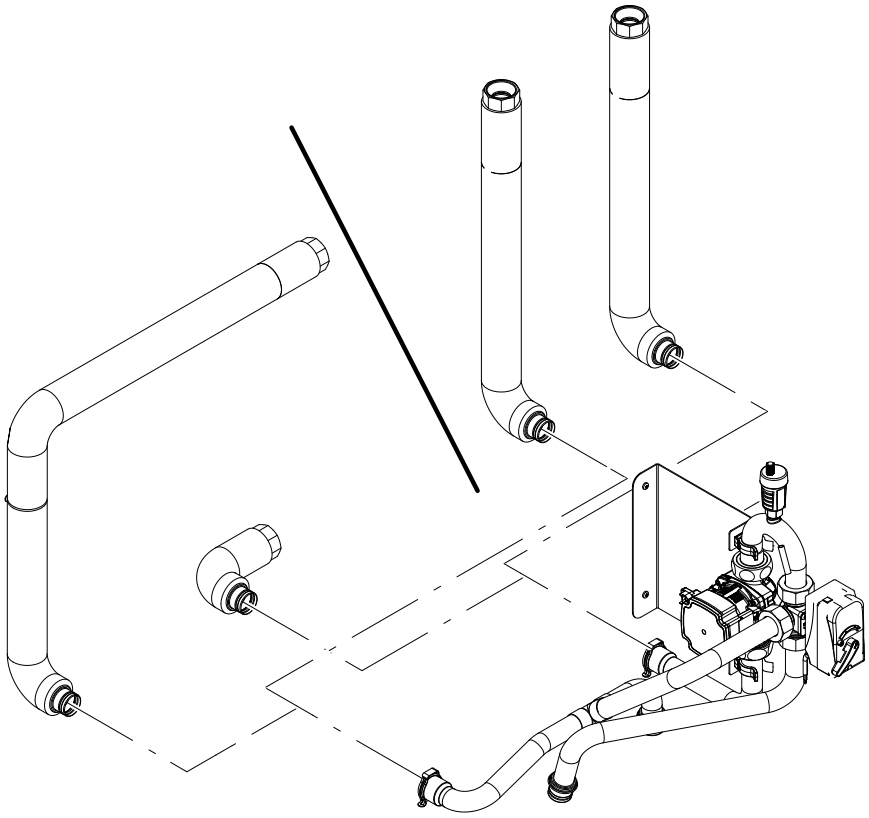
- Hydraulic components for direct connection of a heating circuit with mixer to the indoor unit
- For systems without heating water buffer cylinder in the secondary circuit flow

Note

To ensure the minimum system volume, a heating water buffer cylinder in the secondary circuit return may be required, e.g. Vitocell 100-W/Vitocell 100-E, type SVPA.

Components:

- Heating circuit pump and heating circuit mixer for installation in the indoor unit
- Thermally insulated heating water flow and heating water return line G 1¼, for integration into the hydraulic connection set
- Flow temperature sensor
- Cable harness



Residual head of heating circuit pump in installation kit with mixer
The residual head relates to the circulation pump integrated into the indoor unit: See page 55.

6.6 Divicon heating circuit distributor

Note
The Divicon heating circuit distributor is not suitable for heating circuits also used for cooling mode.

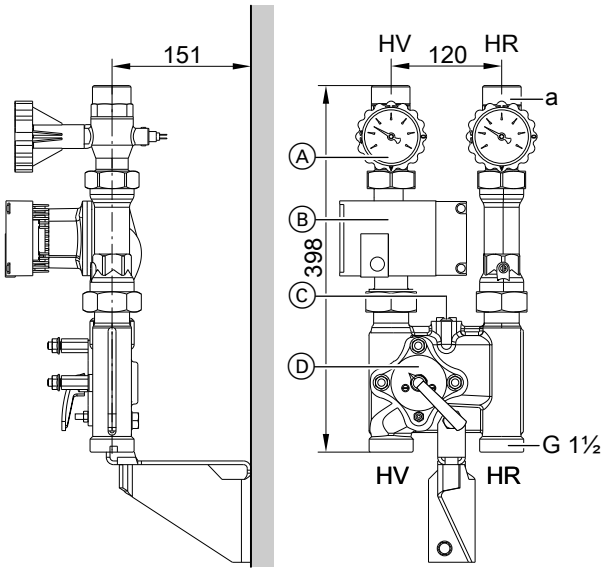
Design and function

- Available with R ¾, R 1 and R 1¼ connections
- With heating circuit pump, check valve, ball valves with integral thermometers and 3-way mixer or without mixer
- Quick and simple installation due to pre-assembled unit and compact design
- All-round thermal insulation shells for low radiation losses
- High efficiency circulation pumps and optimised mixer curve ensure low electricity costs and precise control characteristics
- The bypass valve for hydronic balancing of the heating system is available as an accessory and is provided as a threaded component for inserting into the prepared hole in the cast body.
- Individually wall mounted or with a double manifold
- Also available as a set; see Viessmann pricelist for more details.

For part numbers in conjunction with the different circulation pumps, see the Viessmann pricelist.
The dimensions of the heating circuit distributor are the same, with or without mixer.

Installation accessories (cont.)

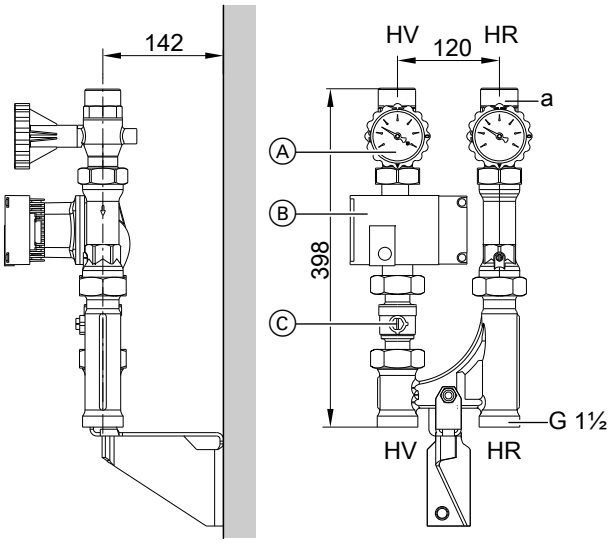
Divicon with mixer



Wall mounting, shown without thermal insulation and without mixer drive extension kit

HR Heating return
HV Heating flow
Ⓐ Ball valves with thermometer (as programming unit)
Ⓑ Circulation pump
Ⓒ Bypass valve (accessories)
Ⓓ Mixer-3

Divicon without mixer



Wall mounted, diagram without thermal insulation

HR Heating return
HV Heating flow
Ⓐ Ball valves with thermometer (as programming unit)
Ⓑ Circulation pump
Ⓒ Ball valve

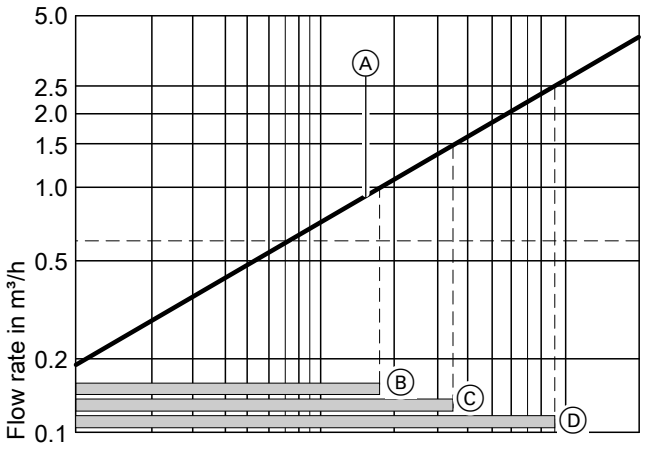
Heating circuit connection	**R**	**¾**	**1**	**1¼**
Max. flow rate	m^3/h	1.0	1.5	2.5
a (female)	Rp	¾	1	1¼
a (male)	G	1¼	1¼	2

6

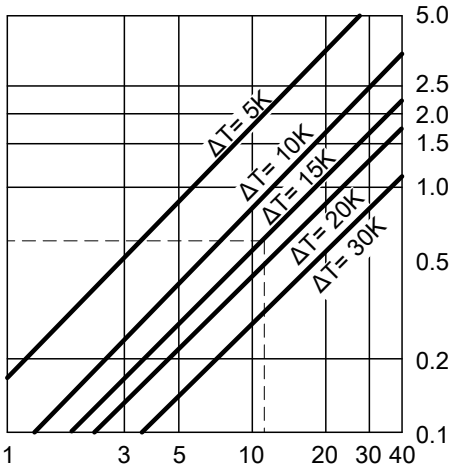
5831388

Installation accessories (cont.)

Determining the required nominal diameter



Mixer control characteristics



Heating circuit output in kW

Ⓐ Divicon with mixer-3
The operating ranges marked Ⓑ to Ⓓ provide optimum control characteristics with the Divicon mixer:
Ⓑ Divicon with mixer-3 (R ¾)
Operating range: 0 to 1.0 m³/h
Ⓒ Divicon with mixer-3 (R 1)
Operating range: 0 to 1.5 m³/h
Ⓓ Divicon with mixer-3 (R 1¼)
Operating range: 0 to 2.5 m³/h

Example:
- Heating circuit for radiators with a heating output of $\dot{Q}$ = 11.6 kW
- Heating system temperature 75/60 °C (ΔT = 15 K)

$$\dot{Q} = \dot{m} \cdot c \cdot \Delta T \qquad c = 1.163 \ \frac{Wh}{kg \cdot K} \qquad \dot{m} \triangleq \dot{V} \ (1\ kg \approx 1\ dm^3)$$

$$\dot{V} = \frac{\dot{Q}}{c \cdot \Delta T} = \frac{11600\ W \cdot kg \cdot K}{1.163\ Wh \cdot (75\text{-}60)\ K} = 665 \ \frac{kg}{h} \triangleq 0.665 \ \frac{m^3}{h}$$

c Specific thermal capacity
$\dot{m}$ Mass flow rate
$\dot{Q}$ Heating output
$\dot{V}$ Flow rate
Select the smallest possible mixer within the application limit with the value $\dot{V}$.
Example result: Divicon with mixer-3 (R ¾)

Circulation pump curves and pressure drop on the heating water side

The residual pump head results from the differential between the selected pump curve and the pressure drop curve of the respective heating circuit distributor or further components (pipe assembly, distributor, etc.).
The following pump graphs show the pressure drop curves of the different Divicon heating circuit distributors.
Maximum flow rate for Divicon:
- With R ¾ = 1.0 m³/h
- With R 1 = 1.5 m³/h
- With R 1¼ = 2.5 m³/h

Example:
Flow rate $\dot{V}$ = 0.665 m³/h

Selected:
- Divicon with mixer R ¾
- Wilo Yonos PARA 25/6 circulation pump, variable differential pressure operating mode and set to maximum delivery head
- Pump rate 0.7 m ³/h

Head of the relevant pump curve:	48 kPa
Divicon pressure drop:	3.5 kPa
Residual head:	48 kPa – 3.5 kPa = 44.5 kPa.

Note
For further components (pipe assembly, distributor, etc.) determine the pressure drop and deduct it from the residual head.

Differential pressure-dependent heating circuit pumps
According to the [German] Energy Saving Ordinance (EnEV), circulation pumps in central heating systems must be sized in accordance with current technical rules.
Ecodesign Directive 2009/125/EC requires high efficiency circulation pumps to be used throughout Europe from 1 January 2013, if the pumps are not installed in the heat generator.

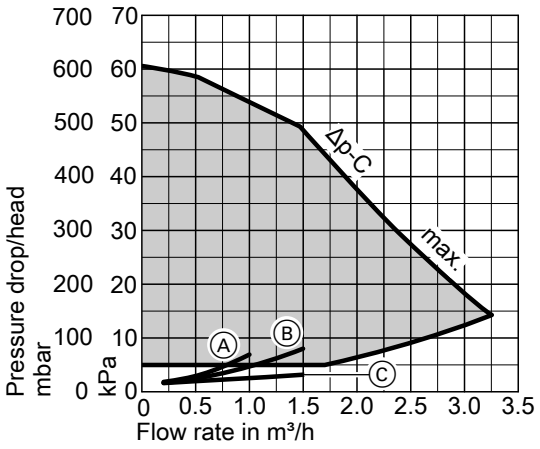
Design information
The use of differential pressure-dependent heating circuit pumps requires heating circuits with variable flow rates, e.g. single-line and twin-line heating systems with thermostatic valves and underfloor heating systems with thermostatic valves or zone valves.

5831388

Installation accessories (cont.)

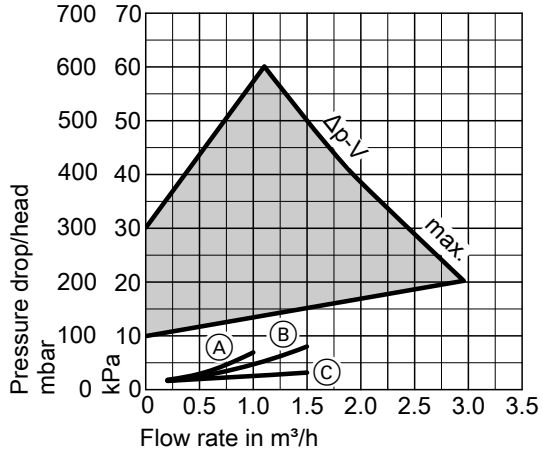
Wilo Yonos PARA 25/6
- Particularly power saving, high efficiency circulation pump
- Energy efficiency index EEI ≤ 0.20

Operating mode: Constant differential pressure



Ⓐ Divicon R ¾ with mixer
Ⓑ Divicon R 1 with mixer
Ⓒ Divicon R ¾ and R 1 without mixer

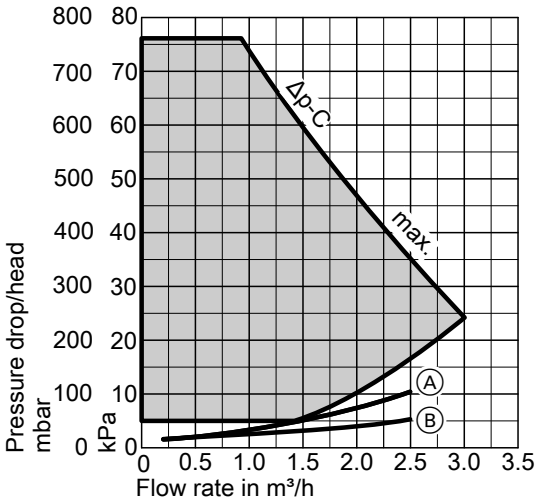
Operating mode: Variable differential pressure



Ⓐ Divicon R ¾ with mixer
Ⓑ Divicon R 1 with mixer
Ⓒ Divicon R ¾ and R 1 without mixer

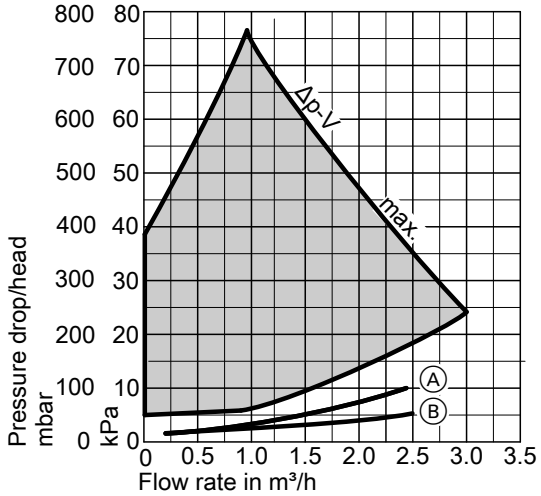
Wilo Yonos PARA Opt. 25/7.5
- Energy efficiency index EEI ≤ 0.21

Operating mode: Constant differential pressure



Ⓐ Divicon R 1¼ with mixer
Ⓑ Divicon R 1¼ without mixer

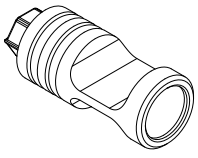
Operating mode: Variable differential pressure



Ⓐ Divicon R 1¼ with mixer
Ⓑ Divicon R 1¼ without mixer

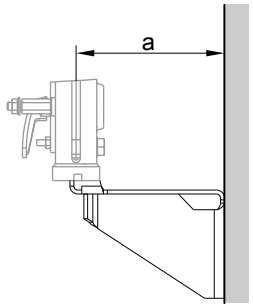
Bypass valve

Part no. 7464889
- For hydronic balancing of the heating circuit with mixer
- To be inserted into the Divicon.



Wall mounting bracket for individual Divicon

Part no. 7465894
With screws and rawl plugs



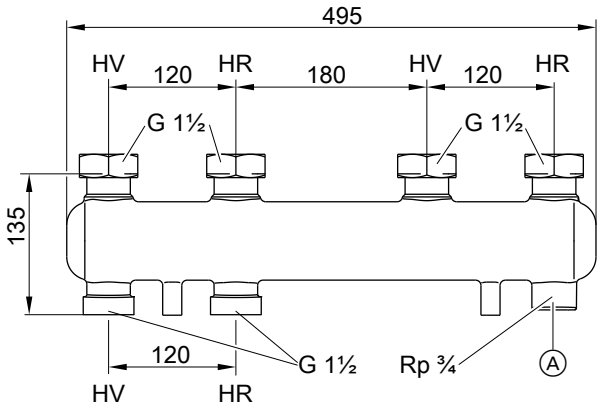
Divicon		With mixer	Without mixer
a	mm	151	142

Manifold

- With thermal insulation
- Wall mounted with wall mounting bracket to be ordered separately
- The connection between boiler and manifold must be made on site.

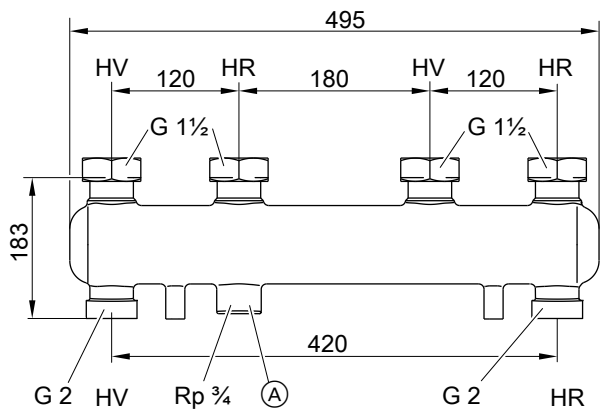
For 2 Divicons

Part no. 7460638
For Divicon R ¾ and R 1



Ⓐ Connection option for expansion vessel
HV Heating water flow
HR Heating water return

Part no. 7466337
For Divicon R 1¼

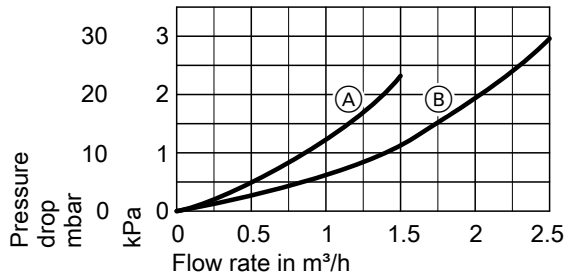


Ⓐ Connection option for expansion vessel
HV Heating water flow
HR Heating water return

6

Installation accessories (cont.)

Pressure drop

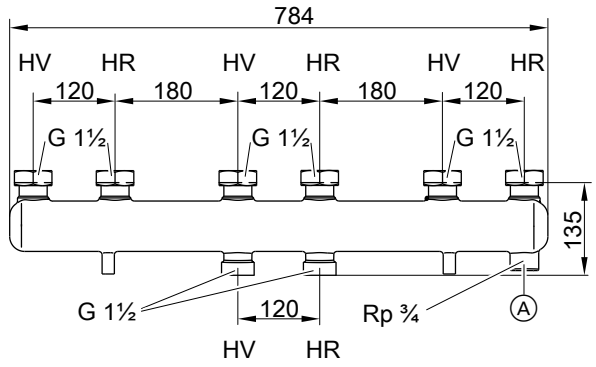


Ⓐ Manifold for Divicon R ¾ and R 1
Ⓑ Manifold for Divicon R 1¼

For 3 Divicons

Part no. 7460643

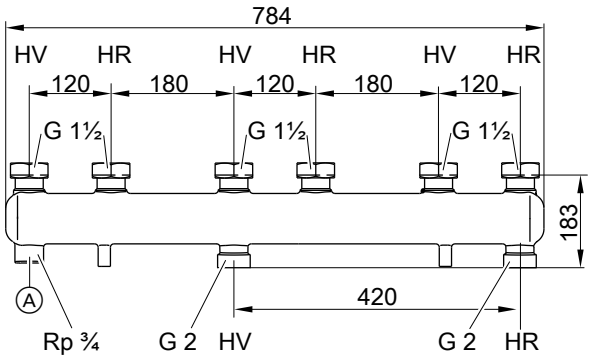
For Divicon R ¾ and R 1



Ⓐ Connection option for expansion vessel
HV Heating water flow
HR Heating water return

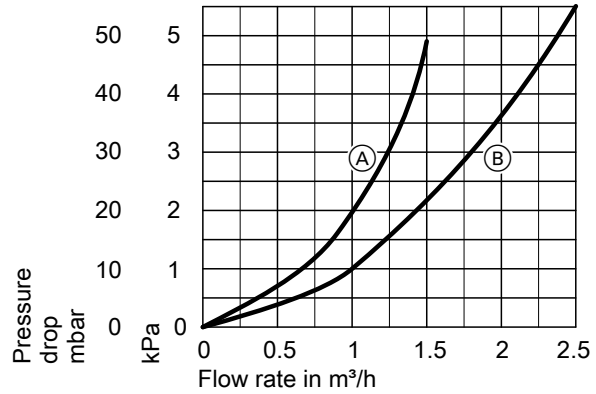
Part no. 7466340

For Divicon R 1¼



Ⓐ Connection option for expansion vessel
HV Heating water flow
HR Heating water return

Pressure drop

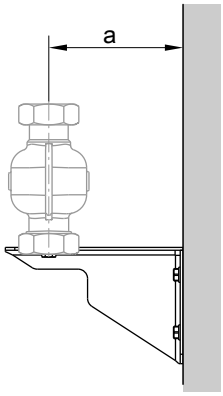


Ⓐ Manifold for Divicon R ¾ and R 1
Ⓑ Manifold for Divicon R 1¼

Wall mounting bracket for manifold

Part no. 7465439
With screws and rawl plugs

Divicon		R ¾ and R 1	R 1¼
a	mm	142	167



6.7 DHW heating accessories, general

Safety assembly to DIN 1988

Part no. 7180662, 10 bar (1 MPa)
AT: Part no. 7179666, 6 bar (0.6 MPa)

- DN 20/R 1
- Max. heat input: 150 kW

Components:
- Shut-off valve
- Non-return valve and test connector
- Pressure gauge connector
- Diaphragm safety valve

6.8 Accessories for DHW heating with integral DHW cylinder

Impressed current anode

Part no. Z004247
- Maintenance-free
- Install in place of the magnesium anode supplied

6.9 Accessories for DHW heating with Vitocell 100-V, type CVWA (300 l/390 l/500 l) and Vitocell 100-W, type CVWA (300 l)

Vitocell 100-V, type CVWA and Vitocell 100-W, type CVWA

Observe the information on the design of DHW cylinders: See from page 124.

For DHW heating in conjunction with heat pumps up to 17 kW and solar collectors; also suitable for boilers and district heating systems

Suitable for the following systems:
- DHW temperature up to **95 °C**
- Heating water flow temperature up to **110 °C**
- Solar flow temperature up to **140 °C**
- Operating pressure on the **heating water side** up to **10 bar (1.0 MPa)**

Installation accessories (cont.)

■ Operating pressure on the **solar side** up to **10 bar (1.0 MPa)**
■ Operating pressure on the **DHW side** up to **10 bar (1.0 MPa)**

Specification

Type			**CVWA**		
Cylinder capacity (AT: Actual water capacity)		**l**	**300**	**390**	**500**
Heating water capacity		l	22	27	40
Gross volume		l	322	417	540
DIN registration no.				9W173-13MC/E	
Continuous output for DHW heating from **10 to 45 °C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	85	98	118
		l/h	2093	2422	2896
	80 °C	kW	71	82	99
		l/h	1749	2027	2428
	70 °C	kW	57	66	79
		l/h	1399	1623	1950
	60 °C	kW	42	49	59
		l/h	1033	1202	1451
	50 °C	kW	25	29	36
		l/h	617	723	881
Continuous output for DHW heating from **10 to 60°C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	73	85	102
		l/h	1255	1458	1754
	80 °C	kW	58	67	81
		l/h	995	1159	1399
	70 °C	kW	41	48	59
		l/h	710	830	1008
Heating water flow rate for the stated continuous outputs		m^3/h	3.0	3.0	3.0
Draw-off rate		l/min	15	15	15
Drawable water volume without reheating					
– Cylinder content heated to 45 °C Water at t = 45 °C (constant)		l	210	285	350
– Cylinder content heated to 55 °C Water at t = 55 °C (constant)		l	210	285	350
Heat-up time if connected to a heat pump with 16 kW rated heating output and a heating water flow temperature of 55 **or** 65 °C					
– For DHW heating from 10 to 45 °C		min	50	60	66
– For DHW heating from 10 to 55 °C		min	60	76	85
Max. connectable heat pump output at 65 °C heating water flow and 55 °C DHW temperature and the specified heating water flow rate		kW	12	15	17
Max. aperture area that can be connected to the solar heat exchanger set (accessories)					
– Vitosol-T		m^2	—	6	6
– Vitosol-F		m^2	—	11.5	11.5
Performance factor N_L in conjunction with a heat pump					
Cylinder storage temperature	45 °C		1.7	2.5	3.5
	50 °C		1.9	2.8	3.9
Standby heat loss		kWh/24 h	1.65	1.80	1.90
Dimensions					
Length (∅)					
– With thermal insulation	a	mm	667	859	859
– Excl. thermal insulation		mm	—	650	650
Total width					
– With thermal insulation	b	mm	744	923	923
– Excl. thermal insulation		mm	—	881	881
Height					
– With thermal insulation	c	mm	1734	1624	1948
– Excl. thermal insulation		mm	—	1522	1844
Height when tilted					
– Incl. thermal insulation		mm	1825	—	—
– Excl. thermal insulation		mm	—	1550	1860
Entire **weight** incl. thermal insulation		kg	180	190	200
Heating surface		m^2	3.0	4.0	5.5

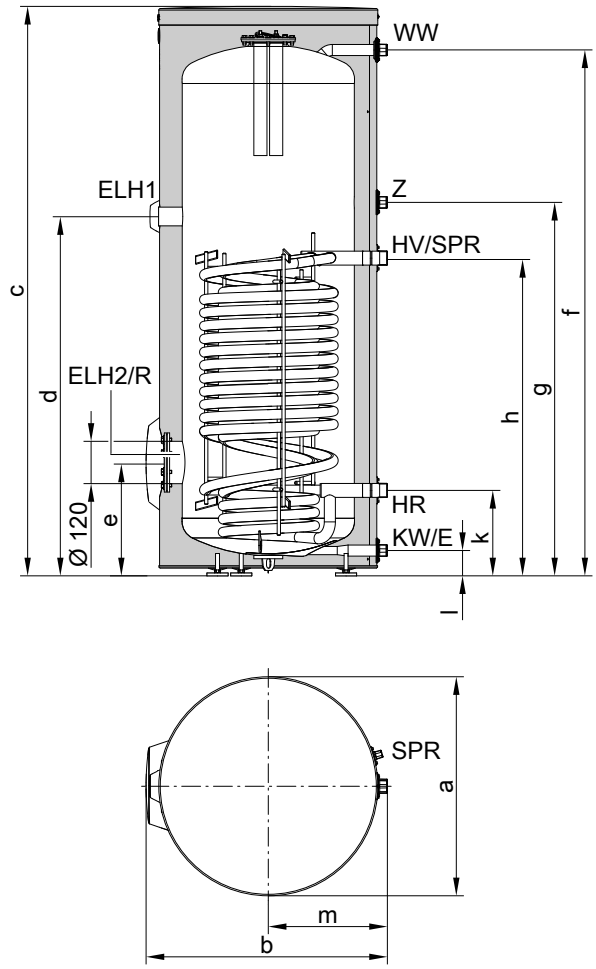
Installation accessories (cont.)

Type		CVWA		
Cylinder capacity (AT: Actual water capacity)	**l**	**300**	**390**	**500**
Connections				
Heating water flow and return (male thread)	R	1¼	1¼	1¼
Cold water, DHW (male thread)	R	1	1	1
Solar heat exchanger set (male thread)	R	—	¾	¾
DHW circulation (male thread)	R	¾	¾	¾
Immersion heater (female thread)	Rp	1½	1½	1½
Energy efficiency class		B	B	B

Information regarding continuous output
When designing systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is achieved only if the rated boiler heating output is ≥ continuous output.

Note
DHW cylinder with a capacity of 300 litres also available as Vitocell 100-W in white.

300 litre capacity



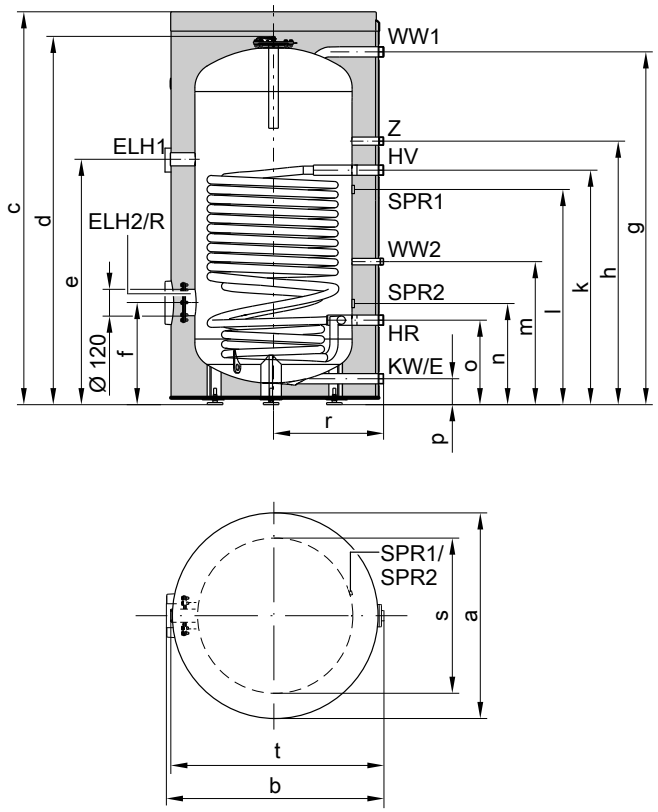
Dimensions

Cylinder capacity		l	300
Length (∅)	a	mm	667
Width	b	mm	744
Height	c	mm	1734
	d	mm	1063
	e	mm	314
	f	mm	1601
	g	mm	1137
	h	mm	967
	k	mm	261
	l	mm	77
	m	mm	360

E Drain outlet
ELH1 Connector for immersion heater
ELH2 Flanged aperture for immersion heater
HR Heating water return
HV Heating water flow
KW Cold water
R Inspection and cleaning aperture with flange cover
SPR Sensor well for cylinder temperature sensor or temperature controller (internal diameter 16 mm)
WW DHW
Z DHW circulation

Installation accessories (cont.)

390 and 500 l capacity



Dimensions

Cylinder capacity		l	390	500
Length (∅)	a	mm	859	859
Width	b	mm	923	923
Height	c	mm	1624	1948
	d	mm	1522	1844
	e	mm	1000	1307
	f	mm	403	442
	g	mm	1439	1765
	h	mm	1070	1370
	k	mm	950	1250
	l	mm	816	1116
	m	mm	572	572
	n	mm	366	396
	o	mm	330	330
	p	mm	88	88
	r	mm	455	455
	s	mm	650	650
	t	mm	881	881

Performance factor N_L

To DIN 4708

Cylinder storage temperature T_{cyl} = cold water inlet temperature + 50 K $^{+5\ K/-0\ K}$

E Drain outlet
ELH1 Connector for immersion heater
ELH2 Flanged aperture for immersion heater
HR Heating water return
HV Heating water flow
KW Cold water
R Inspection and cleaning aperture with flange cover
SPR1 Clamping device for securing immersion temperature sensors to the cylinder jacket. Fixing point for 3 immersion temperature sensors per clamping device
SPR2 Clamping device for securing immersion temperature sensors to the cylinder jacket. Fixing point for 3 immersion temperature sensors per clamping device
WW1 DHW
WW2 DHW from solar heat exchanger set
Z DHW circulation

Cylinder capacity	l	300	390	500
Performance factor N_L				
at heating water flow temperature				
90 °C		9.5	12.6	16.5
80 °C		8.5	11.3	14.9
70 °C		7.5	10.0	13.3

Information on performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl}.

Standard values

- *T_{cyl} = 60 °C → 1.0 × N_L*
- *T_{cyl} = 55 °C → 0.75 × N_L*
- *T_{cyl} = 50 °C → 0.55 × N_L*
- *T_{cyl} = 45 °C → 0.3 × N_L*

Peak output (over 10 minutes)
Relative to performance factor N_L
DHW heating from 10 to 45 °C

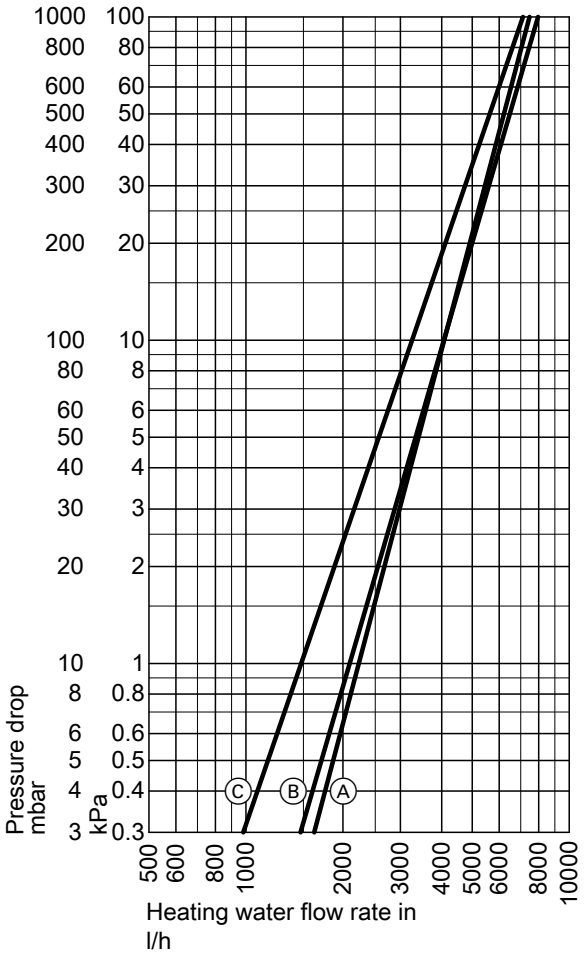
Cylinder capacity	**l**	**300**	**390**	**500**
Peak output				
at heating water flow temperature				
90 °C	l/10 min	415	540	690
80 °C	l/10 min	400	521	667
70 °C	l/10 min	357	455	596

Max. draw-off rate (over 10 minutes)
Relative to performance factor N_L
With reheating
DHW heating from 10 to 45 °C

Cylinder capacity	**l**	**300**	**390**	**500**
Max. draw-off rate				
at heating water flow temperature				
90 °C	l/min	41	54	69
80 °C	l/min	40	52	66
70 °C	l/min	35	46	59

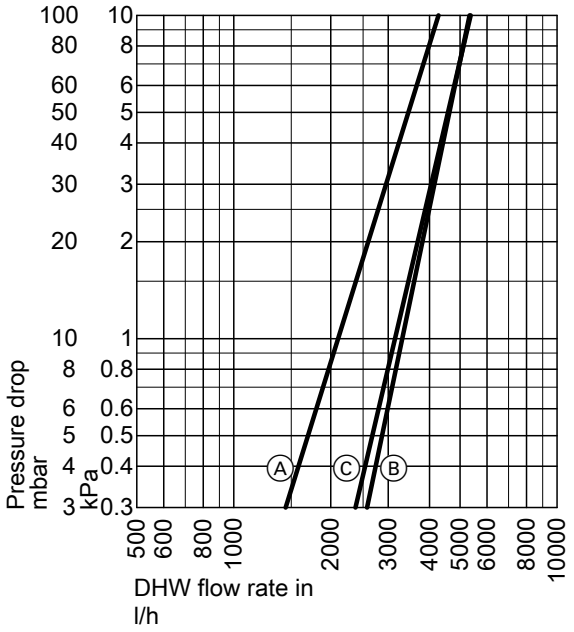
Installation accessories (cont.)

Pressure drop on the heating water side



Ⓐ Cylinder capacity 300 l
Ⓑ Cylinder capacity 390 l
Ⓒ Cylinder capacity 500 l

Pressure drop on the DHW side



Ⓐ Cylinder capacity 300 l
Ⓑ Cylinder capacity 390 l
Ⓒ Cylinder capacity 500 l

6

Immersion heater EHE

Part no. Z012684

For installation in the connector in the **upper** section of the Vitocell 100-V, type CVWA with cylinder capacity **300 l**/**390 l**/**500 l**

- Use the immersion heater only with soft to medium hard water with a calcium hardness up to 14 °dH (hardness level 2, up to 2.5 mol/m³).
- The heating output can be selected: 2, 4 or 6 kW

Components:
- High limit safety cut-out
- Temperature controller

Note
- *A contactor relay, part no. 7814681, is required for switching the immersion heater via the heat pump.*
- *The immersion heater is not intended for operation with 230 V~. If no 400 V connection is available, use commercially available immersion heaters.*

Specification

Output	**kW**	**2**	**4**	**6**
Rated voltage		3/N/PE 400 V/50 Hz		
IP rating		IP 44		
Rated current	A	8.7	8.7	8.7
Heat-up time from 10 to 60 °C				
– Immersion heater in the bottom section	h	8.5	4.3	2.8
– Immersion heater in the top section	h	4.0	2.0	1.3
Content that can be heated by the immersion heater				
– Immersion heater in the bottom section	l	294		
– Immersion heater in the top section	l	136		

5831388

Immersion heater EHE

- **Part no. Z016798**:
  For installation in the flanged aperture in the **upper** section of the Vitocell 100-V, type CVWA with a cylinder capacity of **300 l/390 l**
- **Part no. Z016799**:
  For installation in the connector in the **lower** section of the Vitocell 100-V, type CVWA with a cylinder capacity of **500 l**

- Use the immersion heater only with soft to medium hard water with a calcium hardness up to 14 °dH (hardness level 2, up to 2.5 mol/m³).
- The heating output can be selected: 2, 4 or 6 kW

Components:
- High limit safety cut-out
- Temperature controller
- Flange
- Flange cover (Vitosilver)
- Gasket

Note
- *A contactor relay, part no. 7814681, is required for switching the immersion heater via the heat pump.*
- *The immersion heaters are not designed for 230 V~ operation. If no 400 V connection is available, use commercially available immersion heaters.*

Specification

Output	**kW**	**2**	**4**	**6**
Rated voltage		3/N/PE 400 V/50 Hz		
IP rating		IP 44		
Rated current	A	8.7	8.7	8.7
Heat-up time from 10 to 60 °C				
– Immersion heater in the bottom section	h	8.5	4.3	2.8
– Immersion heater in the top section	h	4.0	2.0	1.3
Content that can be heated by the immersion heater				
– Immersion heater in the bottom section	l	294		
– Immersion heater in the top section	l	136		

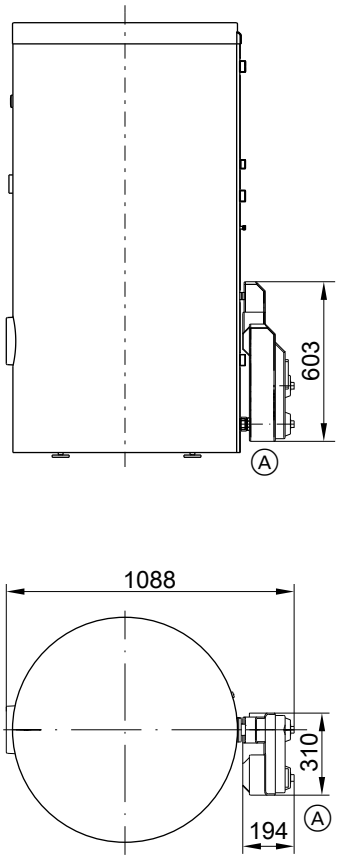
Solar heat exchanger set

Part no. 7186663
For the connection of solar collectors to the Vitocell 100-V, type CVWA (390 and 500 l capacity)
Suitable for systems to DIN 4753. Total water hardness of up to 20 °dH (3.6 mol/m³)

Max. collector surface area that can be connected:
- 11.5 m² flat-plate collectors
- 6 m² tube collectors

Specification

Permissible temperatures	
Solar side	140 °C
Heating water side	110 °C
DHW side	
– For boiler operation	95 °C
– For solar operation	60 °C
Permissible operating pressure	10 bar (1.0 MPa)
Solar side, heating and DHW side	
Test pressure	13 bar (1.3 MPa)
Solar side, heating and DHW side	
Minimum wall clearance	350 mm
For installation of the solar heat exchanger set	
Circulation pump	
Power supply	230 V/50 Hz
IP rating	IP 42



Ⓐ Solar heat exchanger set

Impressed current anode

Cylinder capacity	Part no.
300 l	**7265008**
390 l/500 l	**Z004247**

- Maintenance-free
- Install in place of the magnesium anode supplied

6.10 Accessories for DHW heating with Vitocell 100-V, type CVAA (300 l) and Vitocell 100-W, type CVAA (300 l)

Vitocell 100-V, type CVA/CVAA

Observe the information on the design of DHW cylinders: See from page 124.

For DHW heating in conjunction with boilers and district heating systems; optionally with an electric heater as an accessory for DHW cylinders with 300 and 500 l capacity

Suitable for the following systems:
- DHW temperature up to **95 °C**
- Heating water flow temperature up to **160 °C**

- Operating pressure on the **heating water side** up to **25 bar (2.5 MPa)**
- Operating pressure on the **DHW side** up to **10 bar (1.0 MPa)**

Specification

Type			**CVAA**	**CVA**	**CVAA**	**CVAA**
Cylinder capacity (AT: Actual water capacity)		**l**	**300**	**500**	**750**	**950**
Heating water capacity		l	10.0	12.5	29.7	33.1
Gross volume		l	310.0	512.5	779.7	983.1
DIN registration number			9W241/11–13 MC/E			
Continuous output for DHW heating from **10 to 45 °C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	53	70	109	116
		l/h	1302	1720	2670	2861
	80 °C	kW	44	58	91	98
		l/h	1081	1425	2236	2398
	70 °C	kW	33	45	73	78
		l/h	811	1106	1794	1926
	60 °C	kW	23	32	54	58
		l/h	565	786	1332	1433
	50 °C	kW	18	24	33	35
		l/h	442	589	805	869
Continuous output for DHW heating from **10 to 60°C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	45	53	94	101
		l/h	774	911	1613	1732
	80 °C	kW	34	44	75	80
		l/h	584	756	1284	1381
	70 °C	kW	23	33	54	58
		l/h	395	567	923	995
Heating water flow rate for the stated continuous outputs		m^3/h	3.0	3.0	3.0	3.0
Standby heat loss		kWh/24 h	1.65	1.95	2.28	2.48
Dimensions						
Length (∅)						
– With thermal insulation	a	mm	667	859	1062	1062
– Excl. thermal insulation		mm	—	650	790	790
Width						
– With thermal insulation	b	mm	744	923	1110	1110
– Excl. thermal insulation		mm	—	837	1005	1005
Height						
– With thermal insulation	c	mm	1734	1948	1897	2197
– Excl. thermal insulation		mm	—	1844	1817	2123
Height when tilted						
– With thermal insulation		mm	1825	—	—	—
– Excl. thermal insulation		mm	—	1860	1980	2286
Entire **weight** incl. thermal insulation		kg	156	181	301	363
Heating surface		m^2	1.5	1.9	3.5	3.9

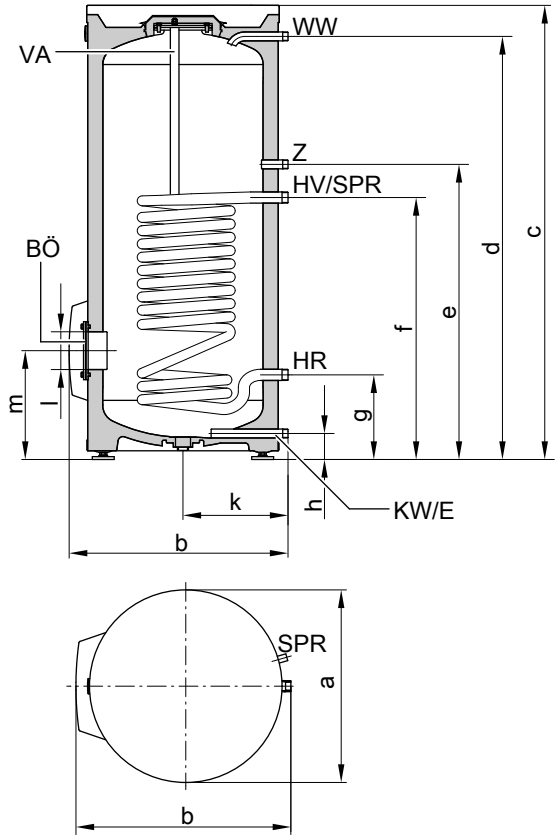
Installation accessories (cont.)

Type		CVAA	CVA	CVAA	CVAA
Cylinder capacity (AT: Actual water capacity)	**l**	**300**	**500**	**750**	**950**
Connections (male thread)					
Heating water flow and return	R	1	1	1¼	1¼
Cold water, DHW	R	1	1¼	1¼	1¼
DHW circulation	R	1	1	1¼	1¼
Energy efficiency class		B	B	—	—

Information regarding continuous output
When designing systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is achieved only if the rated boiler heating output is ≥ continuous output.

Note
Up to 300 l cylinder capacity also available as Vitocell 100-W in white.

Vitocell 100-V, type CVAA, 300 l capacity



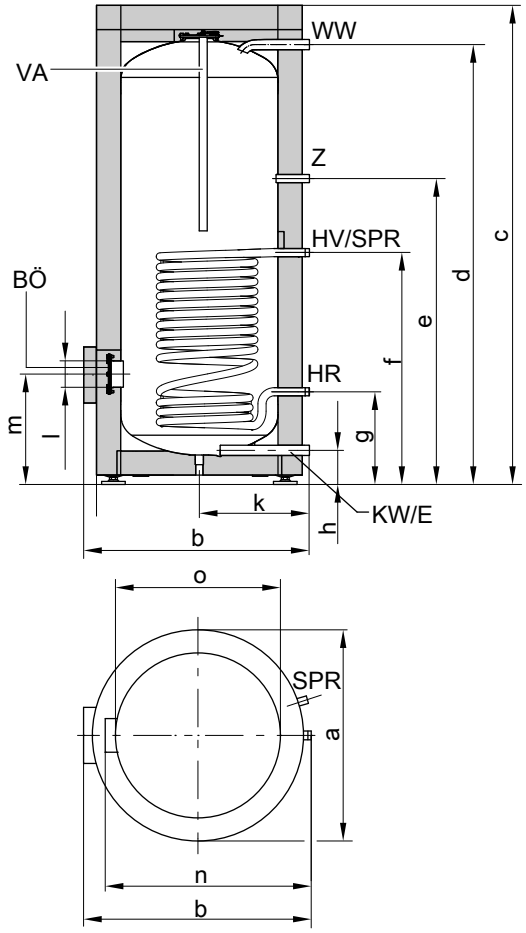
Dimensions

Cylinder capacity			300
Length (∅)	a	mm	667
Width	b	mm	744
Height	c	mm	1734
	d	mm	1600
	e	mm	1115
	f	mm	875
	g	mm	260
	h	mm	76
	k	mm	361
	l	mm	∅ 100
	m	mm	333

BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water
SPR Cylinder temperature sensor of the cylinder temperature controller or temperature controller (internal diameter of sensor well 16 mm)
VA Protective magnesium anode
WW DHW
Z DHW circulation

Installation accessories (cont.)

Vitocell 100-V, type CVA, 500 l capacity



Dimensions

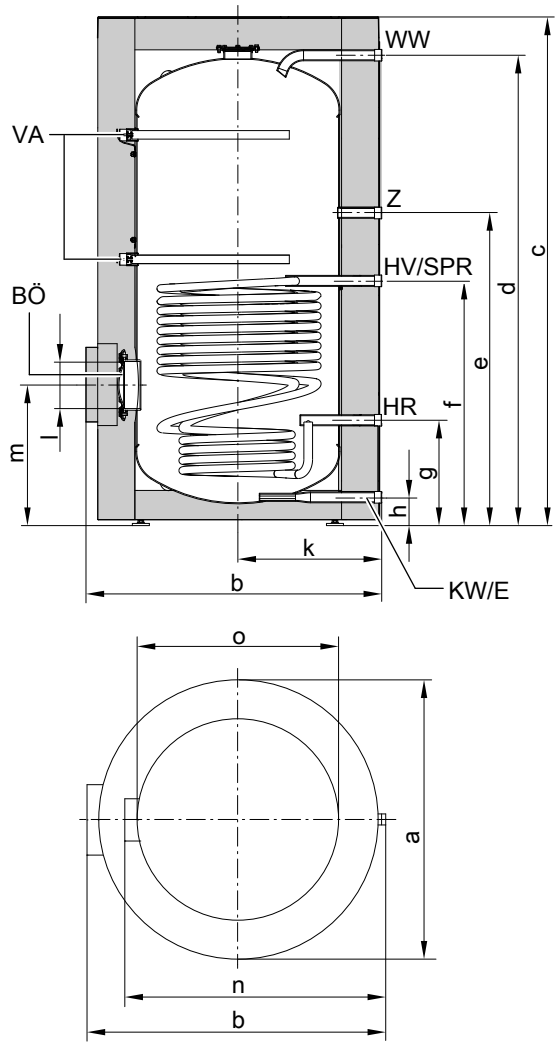
Cylinder capacity			l
Length (∅)	a	mm	859
Width	b	mm	923
Height	c	mm	1948
	d	mm	1784
	e	mm	1230
	f	mm	924
	g	mm	349
	h	mm	107
	k	mm	455
	l	mm	∅ 100
	m	mm	422
Excl. thermal insulation	n	mm	837
Excl. thermal insulation	o	mm	∅ 650

BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water
SPR Cylinder temperature sensor of the cylinder temperature controller or temperature controller (internal diameter of sensor well 16 mm)
VA Protective magnesium anode
WW DHW
Z DHW circulation

6

Installation accessories (cont.)

Vitocell 100-V, type CVAA, 750 and 950 l capacity



Dimensions

Cylinder capacity		l	750	950
Length (∅)	a	mm	1062	1062
Width	b	mm	1110	1110
Height	c	mm	1897	2197
	d	mm	1788	2094
	e	mm	1179	1283
	f	mm	916	989
	g	mm	377	369
	h	mm	79	79
	k	mm	555	555
	l	mm	∅ 180	∅ 180
	m	mm	513	502
Excl. thermal insulation	n	mm	1005	1005
Excl. thermal insulation	o	mm	∅ 790	∅ 790

BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water
SPR Clamping system for fixing immersion temperature sensors to the cylinder jacket. Fixing points for 3 immersion temperature sensors per clamping system
VA Protective magnesium anode
WW DHW
Z DHW circulation

Performance factor N_L

- To DIN 4708.
- Cylinder storage temperature T_{cyl} = cold water inlet temperature + 50 K $^{+5\ K/-0\ K}$

Cylinder capacity	l	300	500	750	950
Performance factor N_L					
at heating water flow temperature					
90 °C		9.7	21.0	38.0	44.0
80 °C		9.3	19.0	32.0	42.0
70 °C		8.7	16.5	25.0	39.0

5831388

Installation accessories (cont.)

Information on performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl}.

Standard values

- *T_{cyl} = 60 °C → 1.0 × N_L*
- *T_{cyl} = 55 °C → 0.75 × N_L*
- *T_{cyl} = 50 °C → 0.55 × N_L*
- *T_{cyl} = 45 °C → 0.3 × N_L*

Peak output (over 10 minutes)

- Relative to performance factor N_L
- DHW heating from 10 to 45 °C

Cylinder capacity	l	300	500	750	950
Peak output					
at heating water flow temperature					
90 °C	l/10 min	407	618	850	937
80 °C	l/10 min	399	583	770	915
70 °C	l/10 min	385	540	665	875

Max. draw-off rate (over 10 min)

- Relative to performance factor N_L
- With reheating
- DHW heating from 10 to 45 °C

Cylinder capacity	l	300	500	750	950
Max. draw-off rate					
at heating water flow temperature					
90 °C	l/min	41	62	85	94
80 °C	l/min	40	58	77	92
70 °C	l/min	39	54	67	88

Drawable water volume

- Cylinder content heated to 60 °C
- Without reheating

Cylinder capacity	l	300	500	750	950
Draw-off rate	l/min	15	15	20	20
Drawable water volume	l	240	420	615	800
Water at t = 60 °C (constant)					

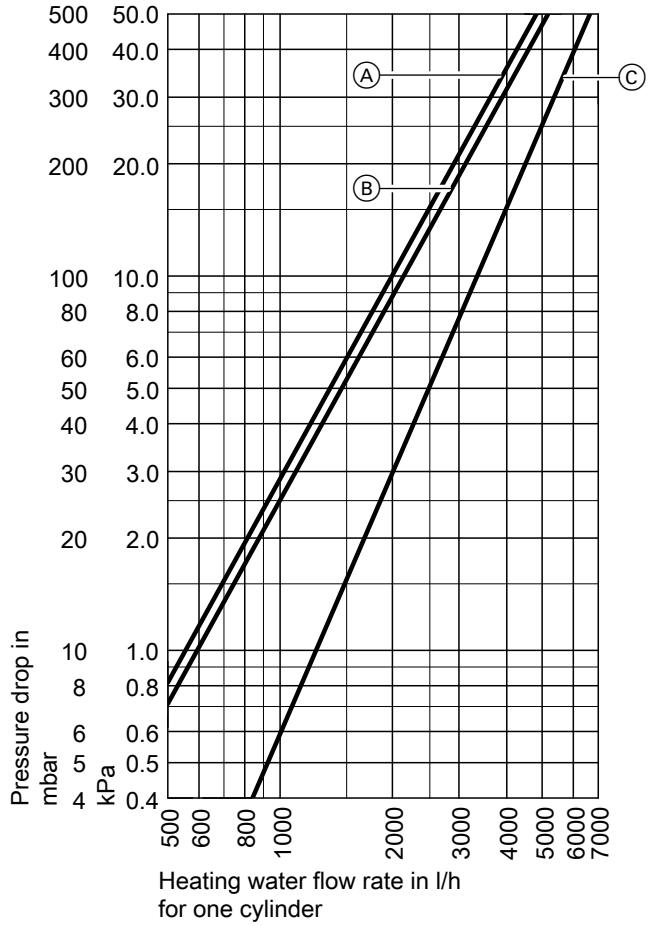
Heat-up time

The heat-up times will be achieved when the maximum continuous output of the DHW cylinder is made available at the relevant heating water flow temperature and when DHW is heated from 10 to 60 °C.

Cylinder capacity	l	300	500	750	950
Heat-up time					
at heating water flow temperature					
90 °C	min	23	28	23	35
80 °C	min	31	36	31	45
70 °C	min	45	50	45	70

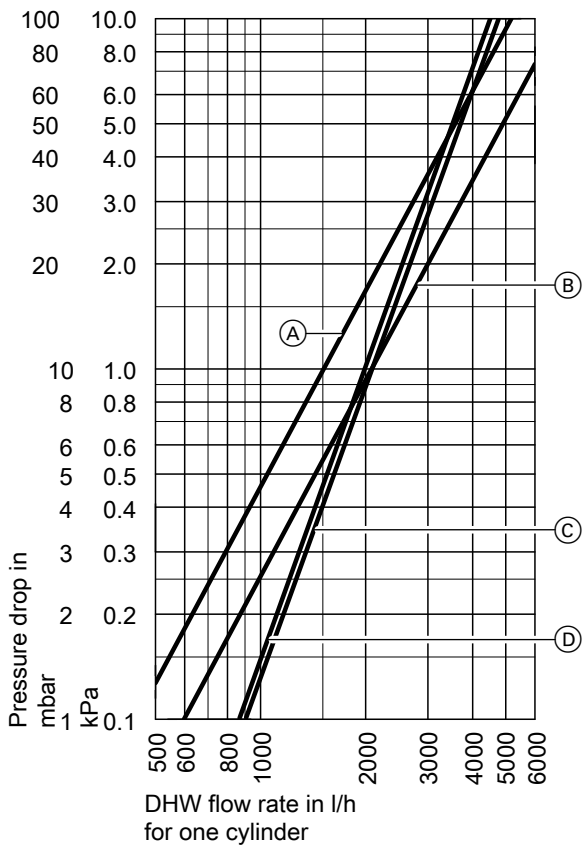
Installation accessories (cont.)

Pressure drop on the heating water side



Ⓐ Cylinder capacity 500 l
Ⓑ Cylinder capacity 300 l
Ⓒ Cylinder capacity 750 l and 950 l

Pressure drop on the DHW side



Ⓐ Cylinder capacity 300 l
Ⓑ Cylinder capacity 500 l
Ⓒ Cylinder capacity 750 l
Ⓓ Cylinder capacity 950 l

EHE Immersion heater

Part no. Z012676
- For cylinder capacity of **300 l**
- For installation into the **lower** flanged aperture
- Use the immersion heater only with soft to medium hard water with a calcium hardness up to 14 °dH (hardness level 2, up to 2.5 mol/m³).
- The heating output can be selected: 2, 4 or 6 kW

Components:
- High limit safety cut-out
- Temperature controller

Note
- *A contactor relay, part no. 7814681, is required for switching the immersion heater via the heat pump.*
- *The immersion heater is not intended for operation with 230 V~. If no 400 V connection is available, use commercially available immersion heaters.*

Specification

Output	**kW**	**2**	**4**	**6**
Rated voltage		3/N/PE 400 V/50 Hz		
IP rating		IP 44		
Rated current	A	8.7	8.7	8.7
Heat-up time from 10 to 60 °C		7.4	3.7	2.5
Capacity that can be heated by the immersion heater	l	254		

Impressed current anode

Part no. 7265008
- Maintenance free
- Install in place of the magnesium anode supplied

5831388

6.11 Accessories for DHW heating with Vitocell 100-B, type CVBB (300 l) and Vitocell 100-W, type CVBB (300 l)

Vitocell 100-B, type CVBB and Vitocell 100-W, type CVBB

Observe the information on the design of DHW cylinders: See from page 124.

For DHW heating in conjunction with boilers and solar collectors for dual mode operation

- Solar flow temperature up to **160 °C**
- Operating pressure **on the heating water side** up to **10 bar (1.0 MPa)**
- Operating pressure **on the solar side** up to **10 bar (1.0 MPa)**
- Operating pressure **on the DHW side** up to **10 bar (1.0 MPa)**

Suitable for the following systems:
- DHW temperature up to **95 °C**
- Heating water flow temperature up to **160 °C**

Specification

Type			**CVBB**		**CVB**		**CVB**		**CVBB**		**CVBB**	
Cylinder capacity (AT: Actual water capacity)		**l**	**300**		**400**		**500**		**750**		**950**	
Internal indirect coil			**Top**	**Bot-tom**	**Top**	**Bot-tom**	**Top**	**Bot-tom**	**Top**	**Bot-tom**	**Top**	**Bottom**
Heating water capacity		l	6	10	6.5	10.5	9	12.5	13.8	29.7	18.6	33.1
Gross volume		l	316	316	417	417	521.5	521.5	795.5	795.5	1001.7	1001.7
DIN registration no.			9W242/11-13 MC/E						Applied for			
Continuous output For DHW heating from **10 to 45 °C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	31	53	42	63	47	70	76	114	90	122
		l/h	761	1302	1032	1548	1154	1720	1866	2790	2221	2995
	80 °C	kW	26	44	33	52	40	58	63	94	75	101
		l/h	638	1081	811	1278	982	1425	1546	2311	1840	2482
	70 °C	kW	20	33	25	39	30	45	49	73	58	78
		l/h	491	811	614	958	737	1106	1200	1794	1428	1926
	60 °C	kW	15	23	17	27	22	32	35	52	41	56
		l/h	368	565	418	663	540	786	853	1275	1015	1369
	50 °C	kW	11	18	10	13	16	24	26	39	31	42
		l/h	270	442	246	319	393	589	639	955	760	1026
Continuous output For DHW heating from **10 to 60 °C** and a **heating water** flow temperature of … at the heating water flow rate stated below	90 °C	kW	23	45	36	56	36	53	59	79	67	85
		l/h	395	774	619	963	619	911	1012	1359	1157	1465
	80 °C	kW	20	34	27	42	30	44	49	66	56	71
		l/h	344	584	464	722	516	756	840	1128	960	1216
	70 °C	kW	15	23	18	29	22	33	37	49	42	53
		l/h	258	395	310	499	378	567	630	846	720	912
Heating water flow rate for the stated continuous outputs		m^3/h	3.0		3.0		3.0		3.0		3.0	
Max. connectible heat pump output At 55 °C heating water flow temperature and 45 °C DHW temperature for the specified heating water flow rate (both internal indirect coils connected in series)		kW	10		12		14		21		23	
Standby heat loss		kWh/24 h	1.65		1.80		1.95		2.28		2.48	
Standby capacity V_{aux}		l	127		167		231		365		500	
Solar capacity V_{sol}		l	173		233		269		385		450	
Dimensions												
Length (∅)												
– incl. thermal insulation	a	mm	667		859		859		1062		1062	
– excl. thermal insulation		mm	–		650		650		790		790	
Total width												
– incl. thermal insulation	b	mm	744		923		923		1110		1110	
– excl. thermal insulation		mm	–		881		881		1005		1005	
Height												
– incl. thermal insulation	c	mm	1734		1624		1948		1897		2197	
– excl. thermal insulation		mm	–		1518		1844		1797		2103	
Height when tilted												
– incl. thermal insulation		mm	1825		–		–		–		–	
– excl. thermal insulation		mm	–		1550		1860		1980		2286	

Installation accessories (cont.)

Type		CVBB		CVB		CVB		CVBB		CVBB	
Cylinder capacity (AT: Actual water capacity)	**l**	**300**		**400**		**500**		**750**		**950**	
Internal indirect coil		**Top**	**Bottom**	**Top**	**Bottom**	**Top**	**Bottom**	**Top**	**Bottom**	**Top**	**Bottom**
Entire **weight** with thermal insulation	kg	166		167		205		320		390	
Total weight in operation incl. immersion heater	kg	468		569		707		1072		1342	
Heating surface	m^2	0.9	1.5	1.0	1.5	1.4	1.9	1.6	3.5	2.2	3.9
Connections											
Upper indirect coil (male thread)	R	1		1		1		1		1	
Lower indirect coil (male thread)	R	1		1		1		1¼		1¼	
Cold water, DHW (male thread)	R	1		1¼		1¼		1¼		1¼	
DHW circulation (male thread)	R	1		1		1		1¼		1¼	
Immersion heater (female thread)	Rp	1½		1½		1½		–		–	
Energy efficiency class		B		B		B		–		–	

Information regarding the upper indirect coil
The upper indirect coil is designed for connection to a heat generator.

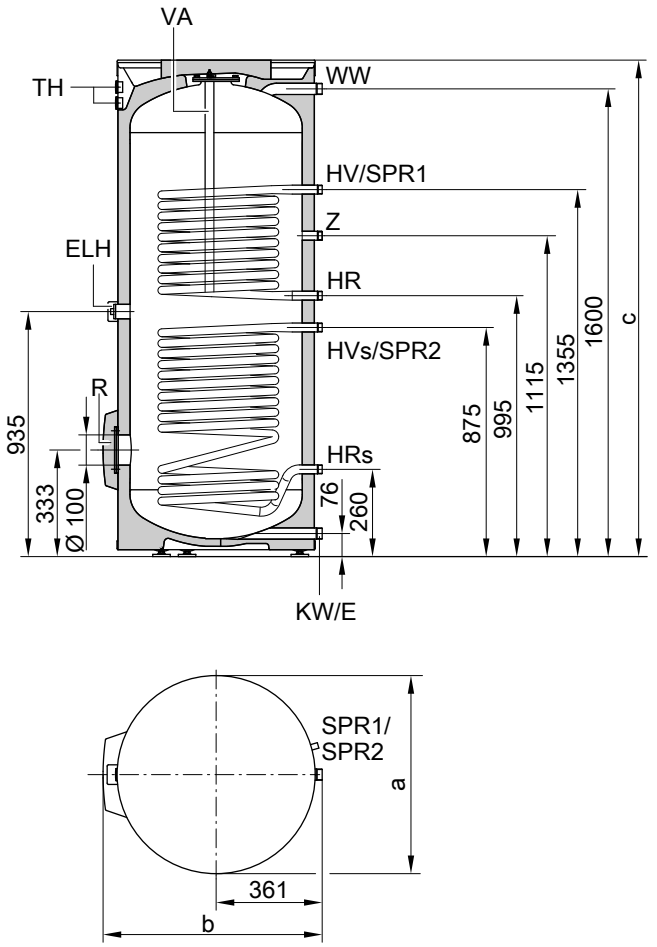
Information regarding the lower indirect coil
The lower indirect coil is designed for connection to solar collectors. To install the cylinder temperature sensor, use the threaded elbow with sensor well included in standard delivery.

Information regarding continuous output
When designing systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is achieved only if the rated boiler heating output is ≥ the continuous output.

Note
*The versions with **300 and 400 l capacity** are also available in white as Vitocell 100-W.*

Installation accessories (cont.)

Vitocell 100-B, type CVBB, 300 l capacity



Dimensions

Cylinder capacity	l	300
a	mm	667
b	mm	744
c	mm	1734

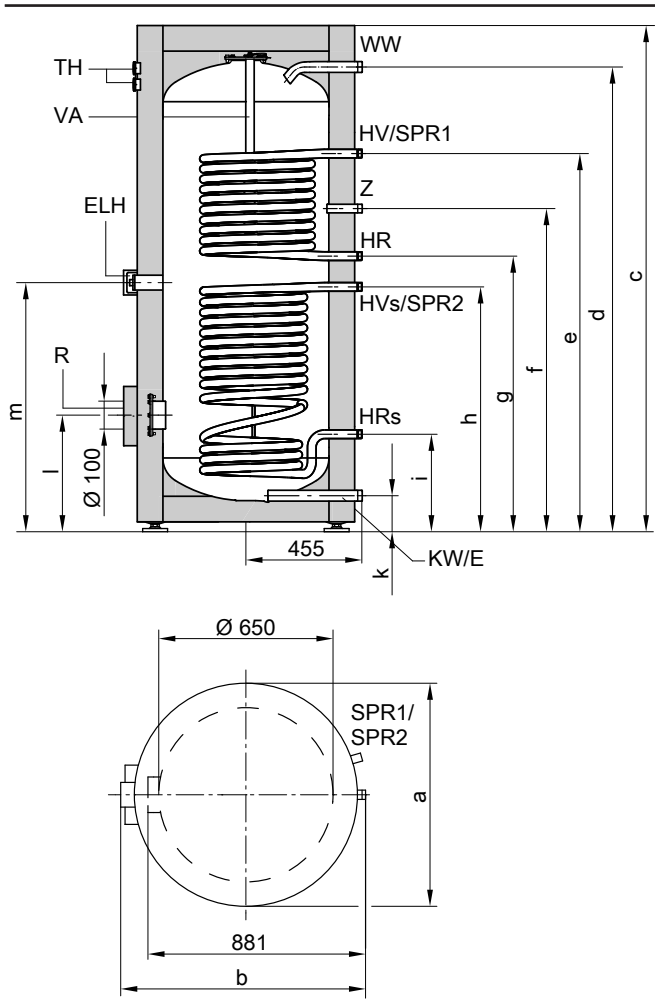
E Drain outlet
ELH Immersion heater
HR Heating water return
HR_s Heating water return, solar thermal system
HV Heating water flow
HV_s Heating water flow, solar thermal system
KW Cold water
R Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)
SPR1 Cylinder temperature sensor for cylinder temperature controller (internal diameter 16 mm)
SPR2 Temperature sensors/thermometers (internal diameter 16 mm)
TH Thermometers (accessories)
VA Protective magnesium anode
WW DHW
Z DHW circulation

6

5831388

Installation accessories (cont.)

Vitocell 100-B, type CVB, 400 and 500 l capacity



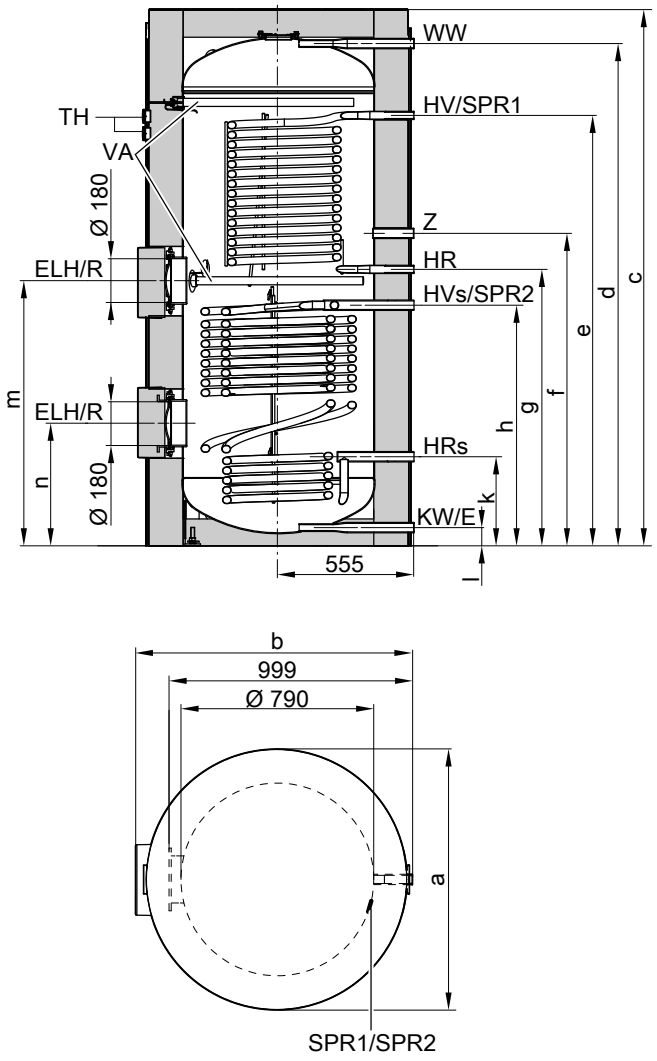
Dimensions

Cylinder capacity	l	400	500
a	mm	859	859
b	mm	923	923
c	mm	1624	1948
d	mm	1458	1784
e	mm	1204	1444
f	mm	1044	1230
g	mm	924	1044
h	mm	804	924
i	mm	349	349
k	mm	107	107
l	mm	422	422
m	mm	864	984

E Drain outlet
ELH Immersion heater
HR Heating water return
HR_s Heating water return, solar thermal system
HV Heating water flow
HV_s Heating water flow, solar thermal system
KW Cold water
R Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)
SPR1 Cylinder temperature sensor for cylinder temperature controller (internal diameter 16 mm)
SPR2 Temperature sensors/thermometers (internal diameter 16 mm)
TH Thermometers (accessories)
VA Protective magnesium anode
WW DHW
Z DHW circulation

Installation accessories (cont.)

Vitocell 100-B, type CVBB, 750 and 950 l capacity



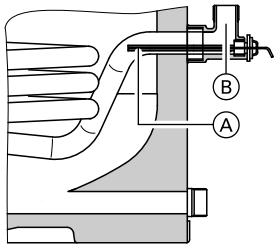
Dimensions

Cylinder capacity	l	750	950
a	mm	1062	1062
b	mm	1110	1110
c	mm	1897	2197
d	mm	1749	2054
e	mm	1464	1760
f	mm	1175	1278
g	mm	1044	1130
h	mm	912	983
k	mm	373	363
l	mm	74	73
m	mm	975	1084
n	mm	509	501

E Drain outlet
ELH Immersion heater or heating lance
HR Heating water return
HR_s Heating water return, solar thermal system
HV Heating water flow
HV_s Heating water flow, solar thermal system
KW Cold water
R Inspection and cleaning aperture with flange cover
SPR1 Clamping system for securing immersion temperature sensors to the cylinder jacket (up to 3 immersion temperature sensors)
SPR2 Clamping system for securing immersion temperature sensors to the cylinder jacket (up to 3 immersion temperature sensors)
TH Thermometers (accessories)
VA Protective magnesium anode
WW DHW
Z DHW circulation

Installation accessories (cont.)

Cylinder temperature sensor for solar operation



Arrangement of cylinder temperature sensor in the heating water return HR_s

Ⓐ Cylinder temperature sensor (standard delivery of solar control unit)
Ⓑ Threaded elbow with sensor well (standard delivery, internal diameter 6.5 mm)

Performance factor N_L
- To DIN 4708
- Upper indirect coil
- Cylinder storage temperature T_{cyl} = cold water inlet temperature + 50 K $^{+5\ K/-0\ K}$

Cylinder capacity	l	300	400	500	750*13	950*13
Performance factor N_L						
at heating water flow temperature						
90 °C		1.6	3.0	6.0	8.0	11.0
80 °C		1.5	3.0	6.0	8.0	11.0
70 °C		1.4	2.5	5.0	7.0	10.0

Information regarding performance factor N_L
The performance factor N_L changes in line with the cylinder storage temperature Tcyl.

Standard values
- *T_{cyl} = 60 °C → 1.0 × N_L*
- *T_{cyl} = 55 °C → 0.75 × N_L*
- *T_{cyl} = 50 °C → 0.55 × N_L*
- *T_{cyl} = 45 °C → 0.3 × N_L*

Peak output (over 10 minutes)
- Relative to performance factor N_L
- DHW heating from 10 to 45 °C

Cylinder capacity	l	300	400	500	750*13	950*13
Peak output						
at heating water flow temperature						
90 °C	l/10 min	173	230	319	438	600
80 °C	l/10 min	168	230	319	438	600
70 °C	l/10 min	164	210	299	400	550

Max. draw-off rate (over 10 minutes)
- Relative to performance factor N_L
- With reheating
- DHW heating from 10 to 45 °C

Cylinder capacity	l	300	400	500	750*13	950*13
Max. draw-off rate						
at heating water flow temperature						
90 °C	l/min	17	23	32	44	60
80 °C	l/min	17	23	32	44	60
70 °C	l/min	16	21	30	40	55

**13 Values determined by calculation.*

Installation accessories (cont.)

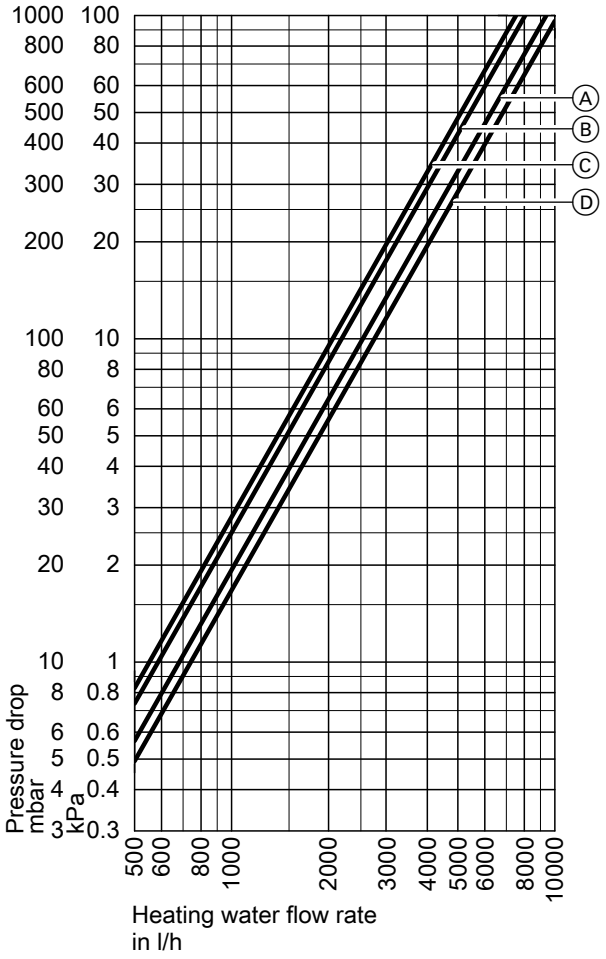
Drawable water volume
- Cylinder content heated to 60 °C
- Without reheating

Cylinder capacity	l	300	400	500	750*13	950*13
Draw-off rate	l/min	15	15	15	15	15
Drawable water volume Water at t = 60 °C (constant)	l	110	120	220	330	420

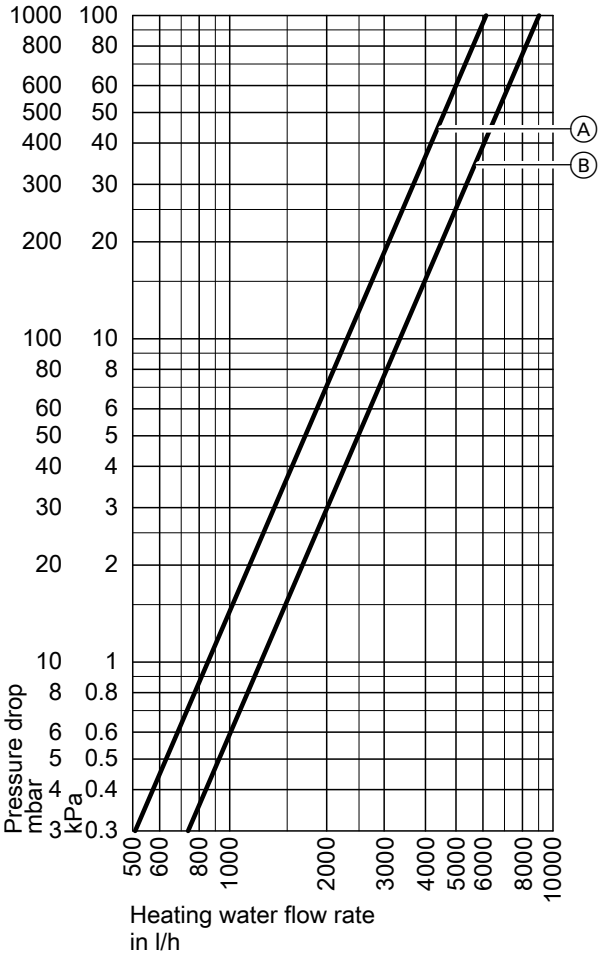
Heat-up time
The specified heat-up times will be achieved when the maximum continuous output of the DHW cylinder is made available at the relevant heating water flow temperature and when DHW is heated from 10 to 60 °C.

Cylinder capacity	l	300	400	500	750*13	950*13
Heat-up time at heating water flow temperature						
90 °C	min	16	17	19	17	18
80 °C	min	22	23	24	21	22
70 °C	min	30	36	37	26	28

Pressure drop on the heating water side



Ⓐ Cylinder capacity 300 l (upper indirect coil)
Ⓑ Cylinder capacity 300 l (lower indirect coil)
Cylinder capacity 400 and 500 l (upper indirect coil)
Ⓒ Cylinder capacity 500 l (lower indirect coil)
Ⓓ Cylinder capacity 400 l (lower indirect coil)

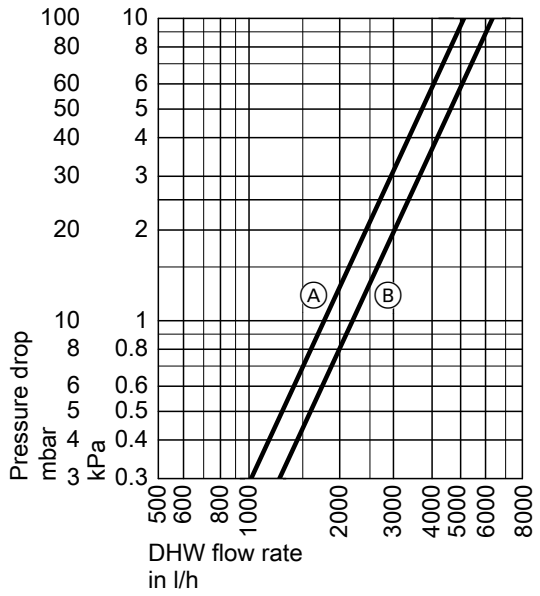


Ⓐ Cylinder capacity 750 and 950 l (upper indirect coil)
Ⓑ Cylinder capacity 750 and 950 l (lower indirect coil)

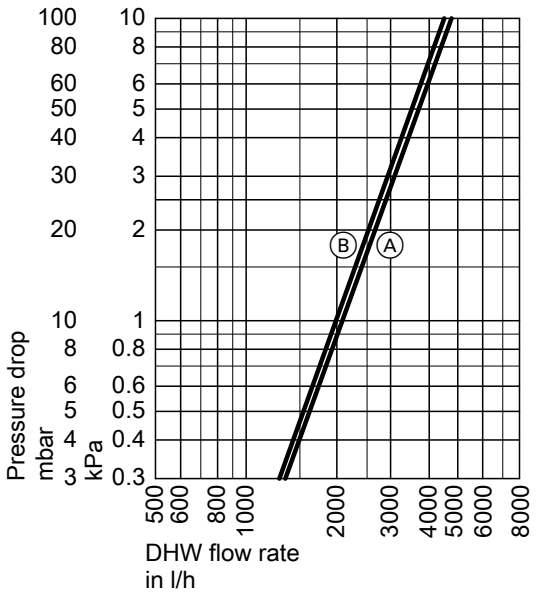
*13 *Values determined by calculation.*

Installation accessories (cont.)

Pressure drop on the DHW side



Ⓐ Cylinder capacity 300 l
Ⓑ Cylinder capacity 400 and 500 l



Ⓐ Cylinder capacity 750 l
Ⓑ Cylinder capacity 950 l

EHE Immersion heater

Part no. Z012676
- For cylinder capacity of **300 l**
- For installation into the **lower** flanged aperture
- Use the immersion heater only with soft to medium hard water with a calcium hardness up to 14 °dH (hardness level 2, up to 2.5 mol/m³).
- The heating output can be selected: 2, 4 or 6 kW

Components:
- High limit safety cut-out
- Temperature controller

Note
- *A contactor relay, part no. 7814681, is required for switching the immersion heater via the heat pump.*
- *The immersion heater is not intended for operation with 230 V~. If no 400 V connection is available, use commercially available immersion heaters.*

Specification

Output	**kW**	**2**	**4**	**6**
Rated voltage		3/N/PE 400 V/50 Hz		
IP rating		IP 44		
Rated current	A	8.7	8.7	8.7
Heat-up time from 10 to 60 °C		7.4	3.7	2.5
Capacity that can be heated by the immersion heater	l	254		

Impressed current anode

Part no. 7265008
- Maintenance free
- Install in place of the magnesium anode supplied

6.12 Solar accessories

Solar heat exchanger set (Divicon)

Part no. ZK03798

For connecting solar thermal systems to heat pump compact appliances
- Connections matched to Solar-Divicon for direct mounting below the Solar-Divicon
- Suitable for systems to DIN 4753. Up to a total water hardness of 20 °dH (3.6 mol/m³)
- Max. collector surface area that can be connected:
  – 5 m² flat-plate collectors
  – 3 m² tube collectors

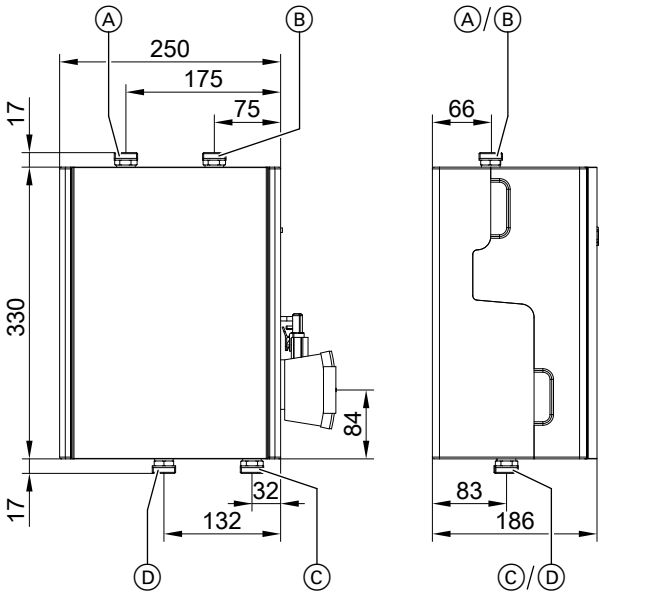
Components:
- Circulation pump
- Plate heat exchanger
- Connection pipes G ¾ (male thread)
- Sensor well for cylinder temperature sensor of the solar control unit
- Thermal insulation

Note
The hydraulic connections for the solar circuit can optionally be routed either upwards or downwards from the appliance.

Specification

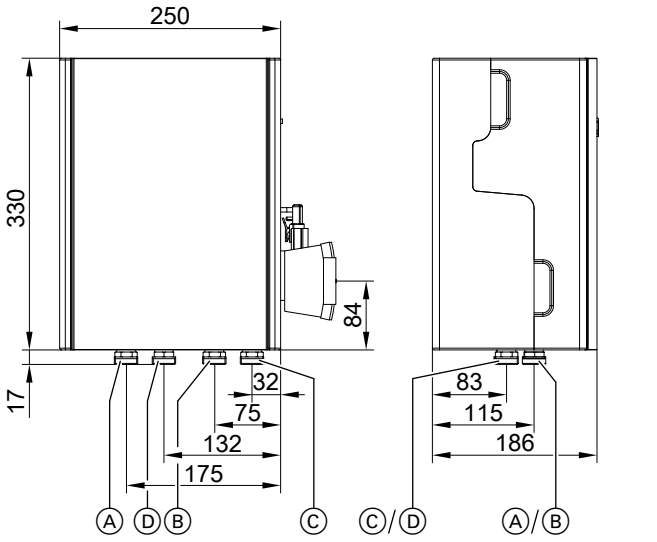
Permissible temperatures	
Solar side	140 °C
Heating water side	110 °C
DHW side	
– For boiler operation	95 °C
– For solar operation	60 °C
Permissible operating pressure Solar side, heating and DHW side	10 bar (1.0 MPa)
Test pressure Solar side, heating and DHW side	13 bar (1.3 MPa)
Circulation pump	
Power supply	230 V/50 Hz
IP rating	IP 42

Hydraulic connections upwards and downwards



Ⓐ Solar circuit return
Ⓑ Solar circuit flow
Ⓒ DHW cylinder return
Ⓓ DHW cylinder flow

Hydraulic connections downwards



Ⓐ Solar circuit return
Ⓑ Solar circuit flow
Ⓒ DHW cylinder return
Ⓓ DHW cylinder flow

6

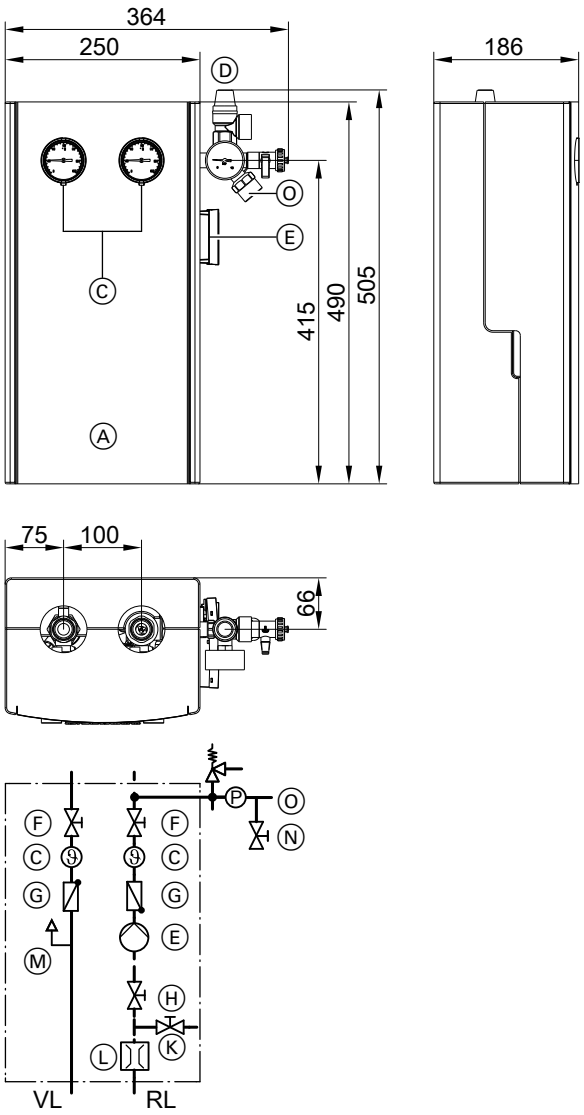
5831388

Solar Divicon, type PS10

Part no. Z017690

Pump station for the collector circuit
- With variable speed high efficiency circulation pump for alternating current
  Delivery head: 6.0 m at a pump rate of 1000 l/h
- Integrated SDIO/SM1A electronics module for solar control
- For apertures of up to 40 m^2 in area for Vitosol 200-F, 300-F, 200-T and 300-T
  The aperture area details refer to "low flow systems" and are subject to the system pressure drop: See technical guide for solar collectors.

Design



Ⓐ Solar-Divicon
Ⓒ Thermometer
Ⓓ Safety assembly (safety valve 6 bar, pressure gauge 10 bar)
Ⓔ High efficiency circulation pump
Ⓕ Shut-off valves
Ⓖ Non-return valves
Ⓗ Shut-off valve
Ⓚ Drain valve
Ⓛ Flow indicator
Ⓜ Air separator
Ⓝ Fill valve
Ⓞ Expansion vessel connection
RL Return
VL Flow

Safety valve in conjunction with Vitosol-FM switching flat-plate collector
Up to a system height of 20 m, the Solar-Divicon may be used with the 6 bar safety valve.
At system heights over 20 m, the safety valve may be replaced with an 8 bar safety valve (see "Vitosol" accessories).

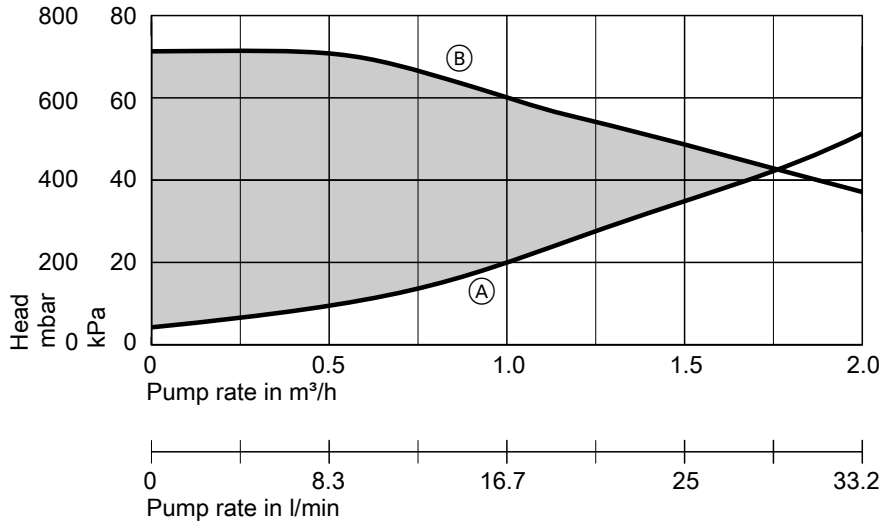
Compact heat pumps
The permissible operating pressure in solar circuits linked to compact heat pump appliances is 6 bar.
Vitosol-FM collectors can only be used in conjunction with compact heat pump appliances where the system height is 20 m maximum.

Specification

Type	**PS10**
High efficiency circulation pump	Wilo Para 15/7.0
– Energy efficiency index EEI	≤ 0.20
Rated voltage	230 V~
Power consumption	
– Min.	3 W
– Max.	45 W
Flow indicator	1 to 13 l/min
Safety valve (solar)	
– At the factory	6 bar 0.6 MPa
– When replacing	10 bar 1 MPa
Max. operating temperature	120 °C
Max. operating pressure	10 bar 1 MPa
Connections (locking ring fitting/double O-ring)	
– Solar circuit	22 mm
– Expansion vessel	22 mm

Installation accessories (cont.)

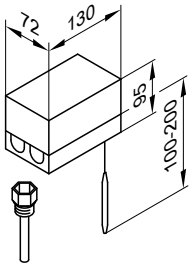
Curve



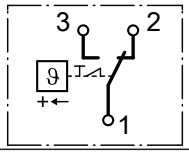
Ⓐ Pressure drop curve
Ⓑ Max. delivery head

High limit safety cut-out for solar thermal system

Part no. 7506168
- With a thermostatic system
- With stainless steel sensor well R ½ x 200 mm
- With setting scale and reset button in casing



Specification

Connection	3-core lead with a cross-section of 1.5 mm²
IP rating	IP 41 to EN 60529
Switching point	120 (110, 100, 95) °C
Max. switching differential	11 K
Breaking capacity	6 (1.5) A, 250 V~
Switching function	with rising temperature from 2 to 3 
DIN reg. no.	DIN STB 98108 or DIN STB 116907

Heat transfer medium "Tyfocor LS"

Part no. 7159727
- Ready-mixed to –28 °C
- 25 l in a disposable container

Tyfocor LS can be mixed with Tyfocor G-LS.

Fill station

Part no. 7188625
For filling the solar circuit

Components:
- Self-priming impeller pump (30 l/min)
- Dirt filter (intake side)
- Hose, 0.5 m long (intake side)
- Connection hose, 2.5 m long (2 pce)
- Packing crate (can be used as flushing tank)

6

5831388

6.13 Cooling accessories: Only for types AWO(-M)-E-AC and AWOT(-M)-E-AC

Contact humidistat 230 V

Part no. 7452646
- For capturing the dew point
- To prevent the formation of condensate

Frost stat

Part no. 7179164
Frost protection safety switch.

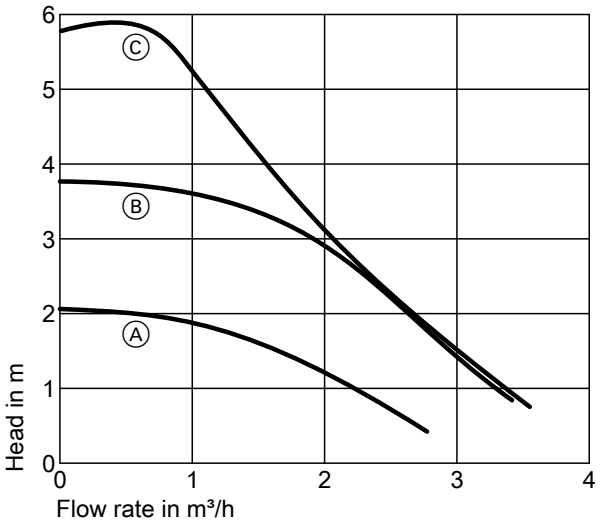
High efficiency circulation pump Wilo Yonos PICO plus 30/1-6

Part no. 7783570
For installation in the cooling circuit in systems with 2 or 3 heating circuits and heating water/coolant buffer cylinder

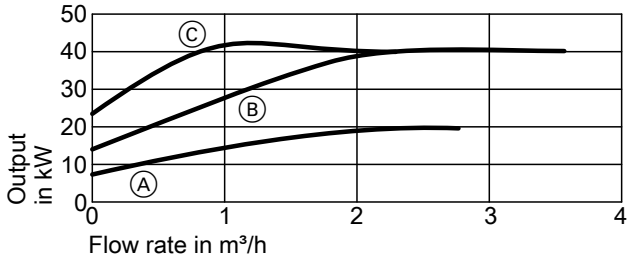
Specification

Permiss. application range	
Temperature range	
– At ambient temperatures up to 25 °C	–10 to +110 °C
– At ambient temperatures up to 40 °C	–10 to +95 °C
Max. permiss. operating pressure	10 bar 1 MPa
Electrical values	
Rated voltage	1/N/PE 230 V/50 Hz
IP rating	IP X2D
Energy efficiency index EEI	≤ 0.20
Connections	
Pipe union (female thread)	Rp 1¼
Connector thread (male thread)	G 2
Installed length	180 mm

Operating mode: Constant speed



Ⓐ Stage 1
Ⓑ Stage 2
Ⓒ Stage 3



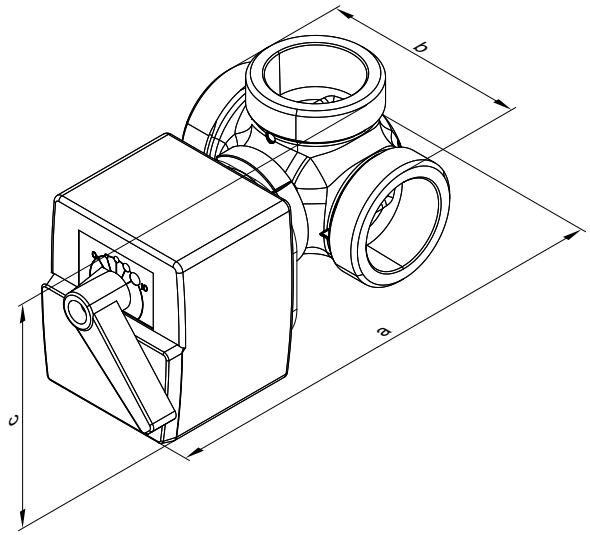
Ⓐ Stage 1
Ⓑ Stage 2
Ⓒ Stage 3

3-way diverter valve

Connection (male thread)	Dimensions in mm			Part no.
	a	b	c	
G 1	145	82	103	**ZK01343**
G 1½	161	139	109	**ZK01344**

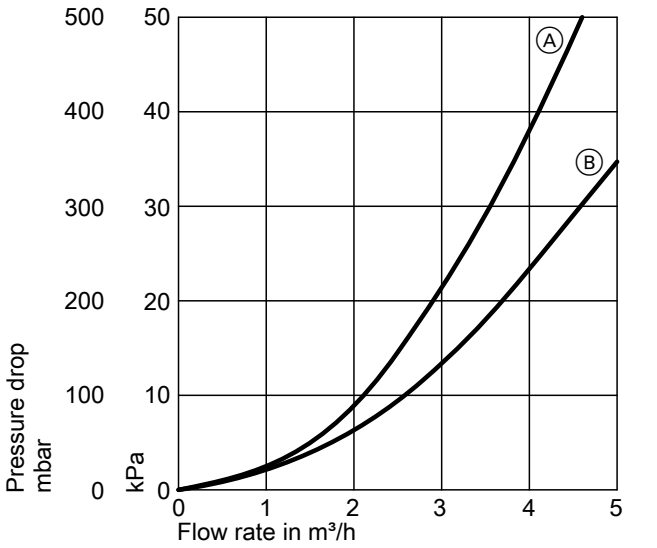
- With electric drive
- For the bypass circuit of the heating water buffer cylinder in cooling mode
- 2 pce required

Note
Available system examples:
*See **www.viessmann-schemes.com**.*



Pressure drop diagrams

3-way diverter valve with G 1 connection

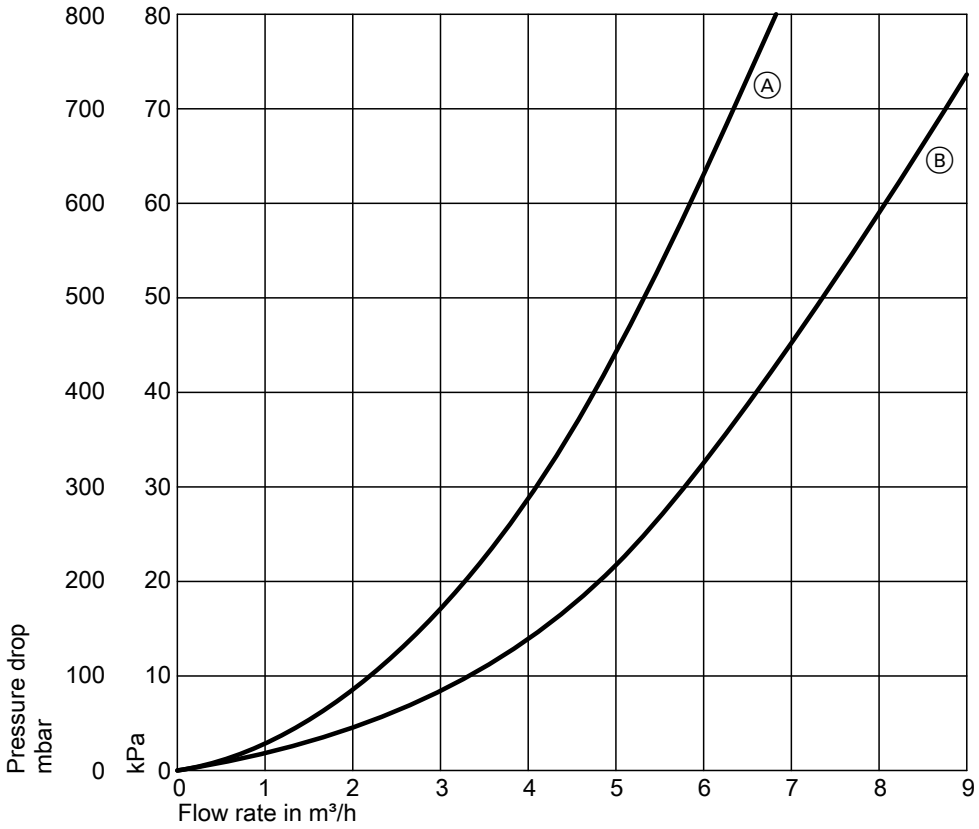


Ⓐ Diverted flow
Ⓑ Straight flow

6

Installation accessories (cont.)

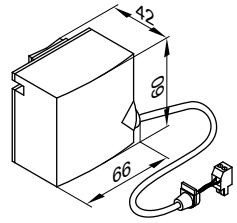
3-way diverter valve with G 1½ connection



Ⓐ Diverted flow
Ⓑ Straight flow

Contact temperature sensor

Part no. 7426463
For capturing the flow temperature of the separate cooling circuit or the heating circuit without mixer, if it is designed as a cooling circuit.



Secured with a tie.

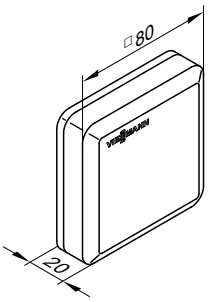
Specification

Lead length	5.8 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

Room temperature sensor for separate cooling circuit

Part no. 7438537
Install in the room to be cooled on an internal wall, opposite radiators/heat sinks. Never install inside shelving units, in recesses, or immediately adjacent to a door or heat source (e.g. direct sunlight, fireplace, TV set etc.).
Connect the room temperature sensor to the control unit.

Connection:
- 2-core lead with a cross-section of 1.5 mm² (copper)
- Lead length from the remote control up to 30 m
- Never route this lead immediately next to 230/400 V cables.



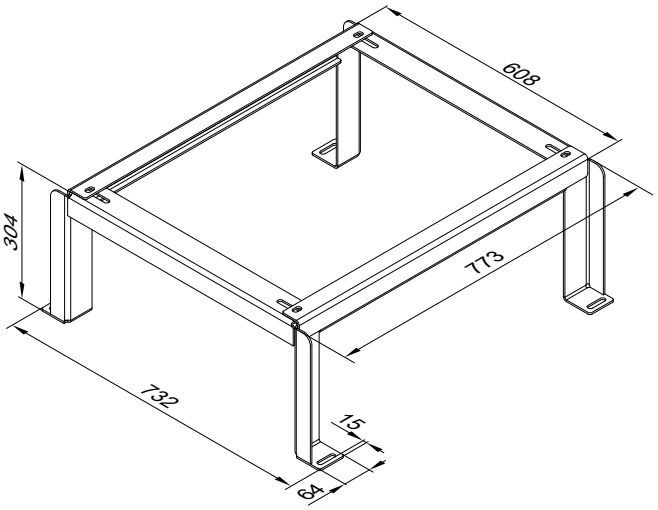
Specification

Protection class	III
IP rating	IP 30 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	−20 to +65 °C

6.14 Brackets for outdoor unit

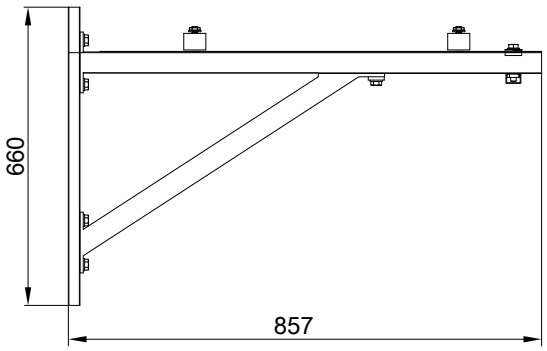
Support for floorstanding installation

Part no. ZK02929
Made from aluminium sections



Bracket set for wall mounting of the outdoor unit

Part no. ZK02930

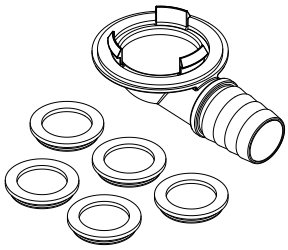


6.15 Miscellaneous

Condensate pan drainage set

Part no. ZK04096
- For draining the condensate from the outdoor unit via a hose
- To be installed only in areas guaranteed to be frost-free

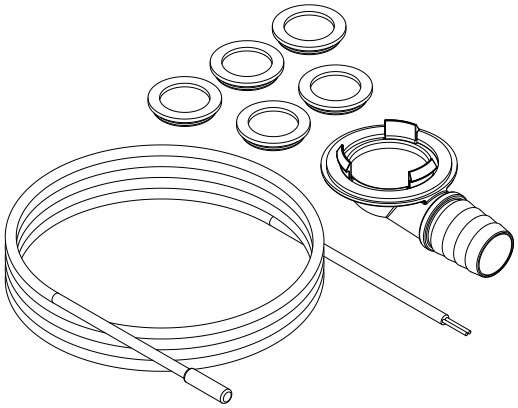
Components:
- Condensate drain elbow
- Sealing plug



Ribbon heater

Part no. ZK04097
- As frost protection for the outdoor unit condensate pan
- Only for free flowing condensate
- Ribbon heater length 1.2 m

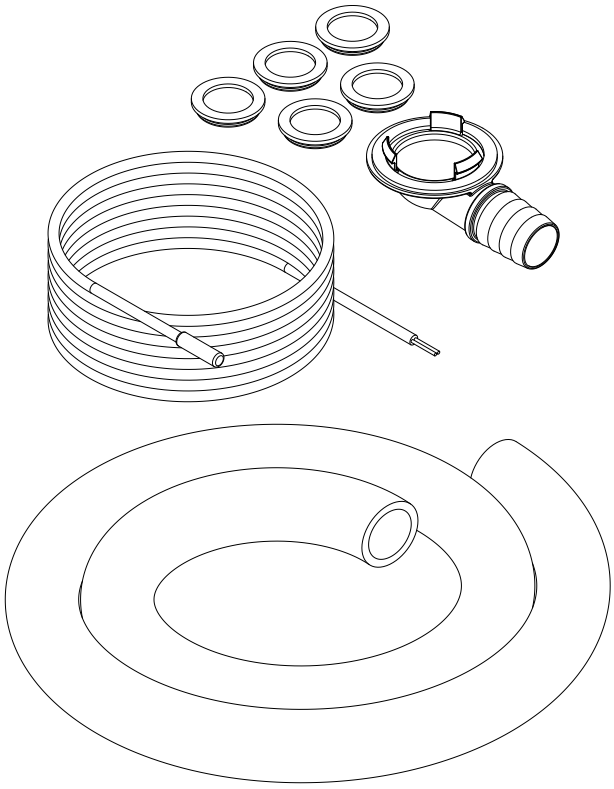
Components:
- Condensate drain elbow
- Sealing plug
- Retaining clips to secure the ribbon heater in the condensate pan



Ribbon heater

Part no. ZK04098
- As frost protection for the outdoor unit condensate pan
- Only where condensate is drained via a hose
- Ribbon heater length 2.5 m

Components:
- Condensate drain elbow
- Sealing plug
- Retaining clips to secure the ribbon heater in the condensate pan



Installation accessories (cont.)

Carrying handles for outdoor unit

Part no. ZK02931
Can be used to carry the outdoor units

Cap set

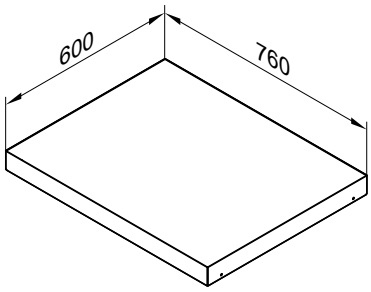
Part no. ZK02933
Caps for covering the openings at the outdoor unit base rails

Special cleaner

Part no. 7249305
1 l spray bottle for cleaning the evaporator

Platform for unfinished floors

Part no. 7417925

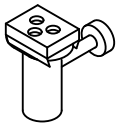


- With adjustable feet, for screed heights between 10 and 18 cm.
- For installation of the appliance on unfinished floors; suitable for siting tight against the wall.
- Incl. thermal insulation.

Note
In the case of installation flush with the wall, insert edge insulation strips for sound insulation between the platform for unfinished floors and the wall.

Tundish set

Part no. 7176014



Tundish with trap and bezel: DN 40

Design information

7.1 Power supply and tariffs

According to current Federal tariffs [Germany], the electrical demand for heat pumps is considered domestic usage. Where heat pumps are used to heat buildings, the local power supply company must first give permission [check with your local power supply company]. Check the connection conditions specified by your local power supply utility for the stated equipment details. It is crucial to establish whether a mono-mode and/or mono-energetic heat pump operation is feasible in the supply area.

It is also important to obtain information about standing charges and energy tariffs, about the options for utilising off-peak electricity during the night and about any power-off periods.
Address any questions relating to these issues to your customer's local power supply utility.

Application procedure

The following details are required to assess the effect of the heat pump operation on the grid of your local power supply utility:
- User address
- Location where the heat pump is to be used
- Type of demand in accordance with general tariffs (domestic, agricultural, commercial, professional and other use)
- Intended heat pump operating mode
- Heat pump manufacturer
- Type of heat pump
- Connected load in kW (from rated voltage and rated current)
- Max. starting current in A
- Max. heat load of the building in kW

7.2 Siting the outdoor unit

The outdoor units are painted with UV resistant paint.

Note
When the heat pump is installed in a corrosive atmosphere, the ambient air and the air drawn in by the heat pump contain substances such as ammonia, sulphur, chloride, salts, etc. These substances can cause internal and external damage to the heat pump. Viessmann heat pumps for outdoor installation are designed for operation in moderately aggressive atmospheres. This makes them suitable for installation in urban and industrial environments as well as in coastal areas.
Higher corrosive loads can cause visual defects on the casing or affect operation. The service life of the heat pump may be shortened.

Installation in coastal areas: Distance < 1000 m

In coastal areas salt and sand particles in the air increase the likelihood of corrosion:
- Site the heat pump where it is protected from direct onshore wind.
- If necessary provide a wind break on site. Observe the minimum clearances to the heat pump: See following chapters.

Requirements of the installation location

- Select a site with good air circulation, so that the cooled air can dissipate and be replenished by warm air.
- Never install in the corners of rooms, in recesses or between walls. This could result in an "air short circuit" between the air being discharged and the air being drawn in.
- When siting the unit where it is exposed to wind, ensure that the wind cannot influence the fan area. This could result in an "air short circuit" between the air being discharged and the air being drawn in. Strong wind can have a negative influence on the evaporator ventilation.
  - An air short circuit in **heating mode** can result in reduced appliance efficiency and defrosting problems.
  - An "air short circuit" during **cooling mode** will result in the heated, discharged air re-entering the unit. This can lead to high pressure faults.
- Select an installation location where the evaporator cannot be blocked by leaves, snow, etc.
- Select the installation site giving due consideration to the physical laws concerning the propagation and reflection of sound: See "Heat pump principles".
- Never install next to or below bedroom windows.
- Never install closer than 3 m to pathways, downpipes or sealed surfaces. The cooled air in the discharge area creates a risk of ice forming when outside temperatures are below 10 °C.
- The installation site must be easily accessible, e.g. for maintenance work.
  Minimum clearances: See page 100.

Installation information

- Floorstanding installation:
  - Use supports for floorstanding installation (accessories): See page 96.
  - Where such supports cannot be used, install the outdoor unit freestanding on a solid base of at least 100 mm height.
  - In difficult climatic conditions (temperatures below zero, snow, humidity) install the appliance on a plinth of approx. 300 mm height.
  - Take account of the weight of the outdoor unit: See "Specification".
- Wall mounting:
  - Use the bracket set for wall mounting (accessories): See page 96.
  - The wall must meet the structural requirements.
- Siting:
  - Never install with the discharge side facing the main wind direction.
- Weather influences:
  - Observe wind loads when installing the unit on sites exposed to the wind.
    Where outdoor units are installed on a flat roof, considerable wind loads may occur, depending on the relevant wind load zone and height of the building. For such installation situations we recommend having the substructure sized by a design engineer in accordance with DIN 1991-1-4.
  - Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See following table.

Pipework internal ∅	**Min. thickness of thermal insulation layer with λ = 0.035 W/(m·K)**
≤ 22 mm	40 mm
> 22 mm	60 mm

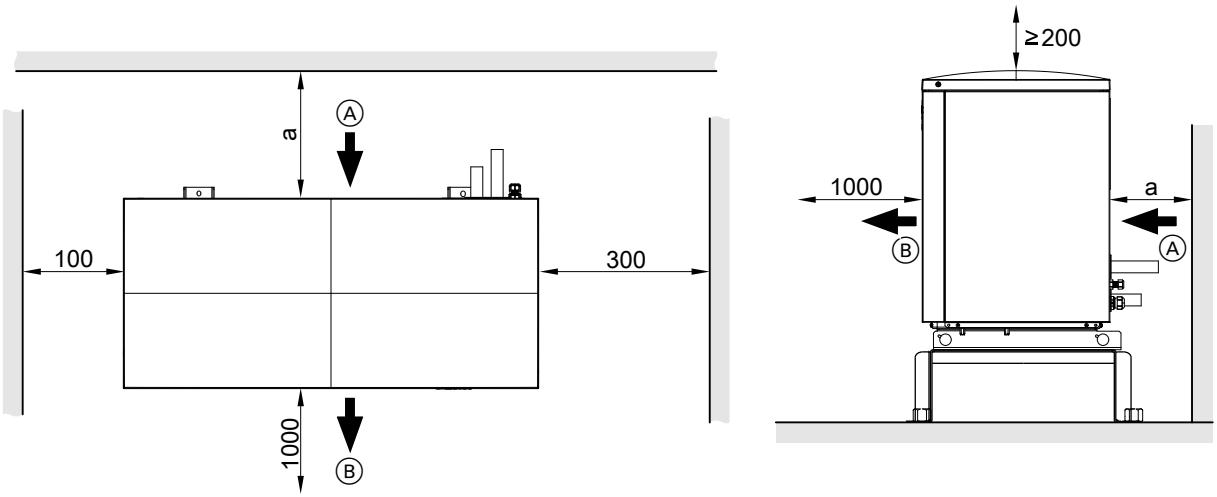
λ Thermal conductivity

  - Incorporate the outdoor unit into the lightning protection system.
  - Consider the heat emitted by the unit when planning your weatherproofing or an enclosure.

- Condensate:
  - Ensure that the condensate drains off freely.
    To create a permanent gravel bed below the outdoor unit as a soakaway: See page 103.
  - In regions where the outside temperature regularly falls below 0 °C we recommend fitting an electric ribbon heater (accessories) for the condensate pan of the outdoor unit.
- For insulating against structure-borne noise and vibrations between the building and outdoor unit:
  - Route connecting cables between the indoor and outdoor units free of stress.
  - Installation only on walls with a high weight per unit area (> 250 kg/m²), i.e. not on lightweight walls, roof structures, etc.
  - Anti-vibration components are included in the standard delivery of the wall mounting brackets.
  - For floorstanding installation, only use the rubber mounts supplied.
  - Do not use additional anti-vibration mounts, springs, rubber mounts, etc.

Outdoor unit minimum clearances

Types 201.A04 to A08 and 221.A04 to A08

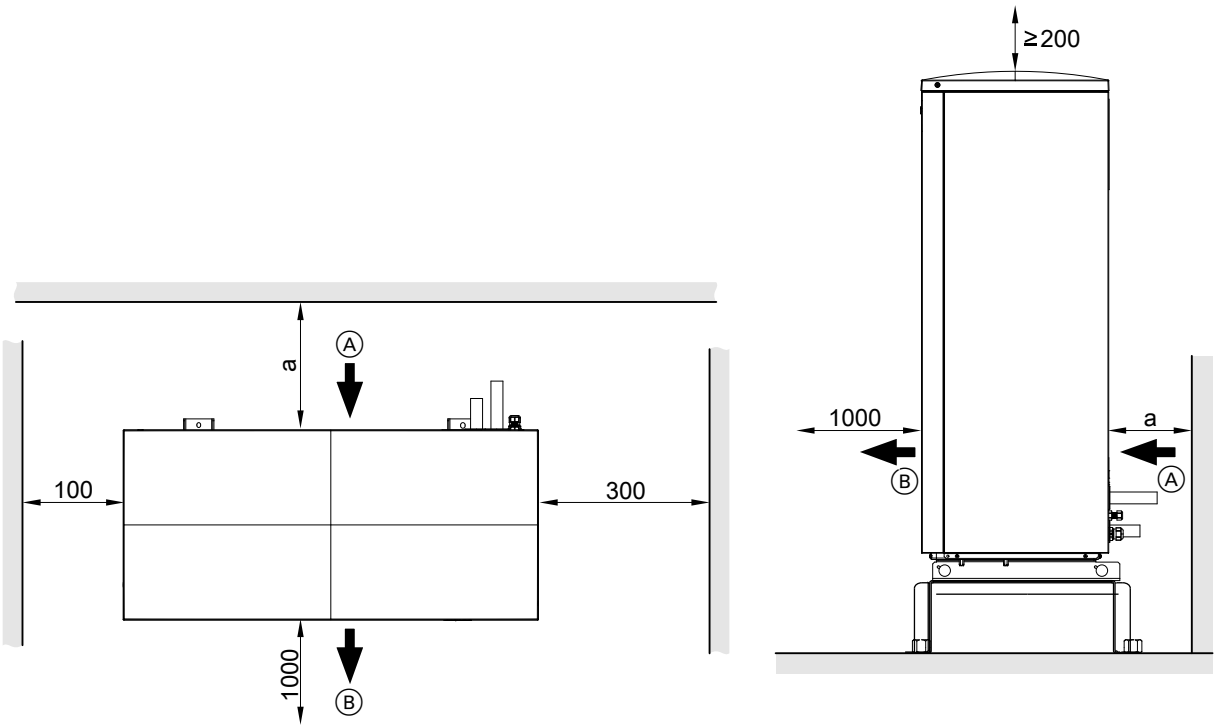


Ⓐ Air intake
Ⓑ Air discharge
a
- Line entry above ground level:
  ≥ 200 mm
- Line entry below ground level:
  ≥ 900 mm

7

5831388

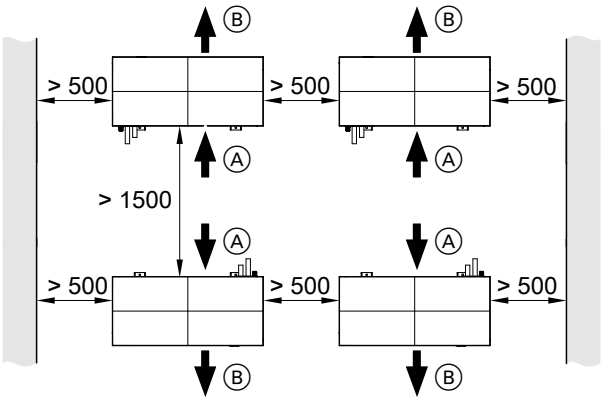
Types 201.A10 to A16 and 221.A10 to A16, 230 V~ and 400 V~



Ⓐ Air intake
Ⓑ Air discharge
a ■ Line entry above ground level:
≥ 200 mm
■ Line entry below ground level:
≥ 900 mm

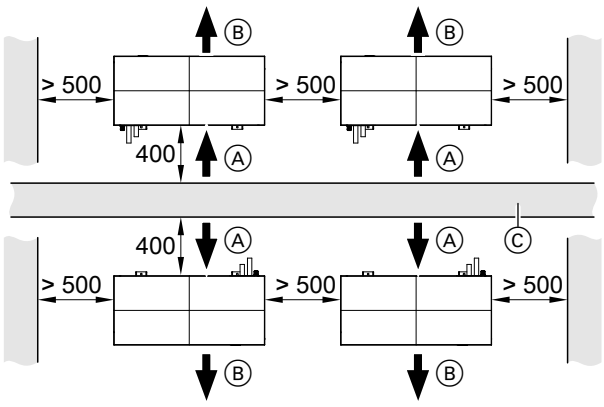
Minimum clearances for heat pump cascade (max. 5 outdoor units)

Facing layout without partition wall



Ⓐ Air intake
Ⓑ Air discharge

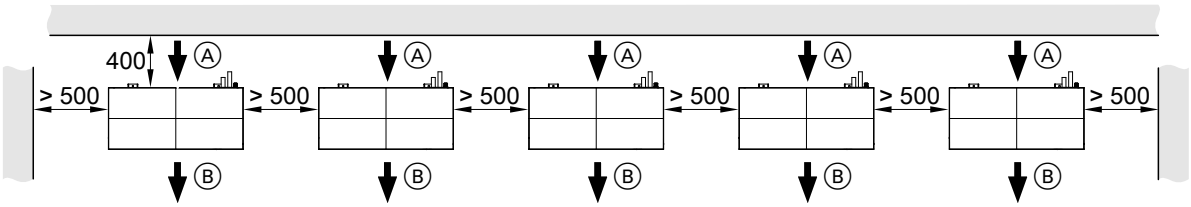
Facing layout with partition wall



Ⓐ Air intake
Ⓑ Air discharge

Design information (cont.)

Single row layout

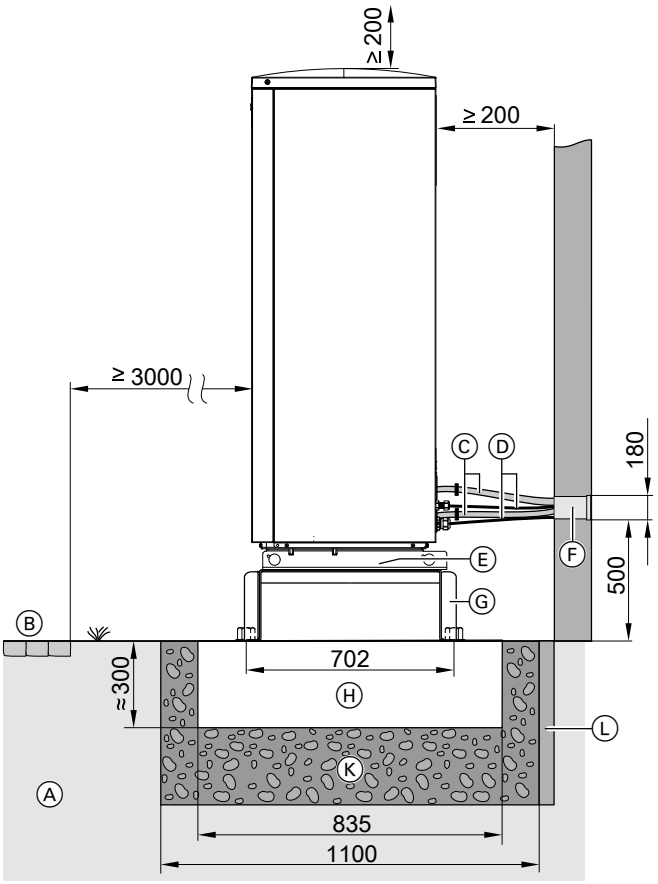


Ⓐ Air intake
Ⓑ Air discharge

Siting information

- *Observe the information regarding noise levels.*
- *Sound emission (TA-Lärm) regulations must be observed [in Germany].*
- *When siting the heat pump, always take into account the distances to neighbouring property in accordance with local building regulations.*
- *During defrosting, cool vapour escapes from the outdoor unit air discharge vents. This vapour discharge must be taken into consideration during installation (choosing the installation location, orientation of the heat pump).*

Floorstanding installation with support, line entry above ground level

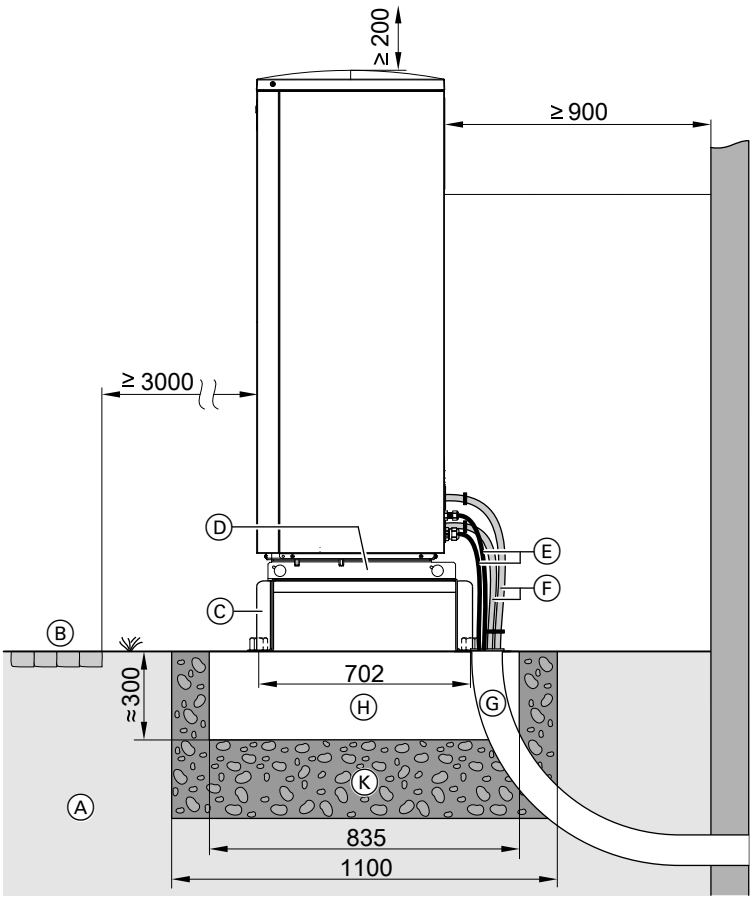


Ⓐ Ground
Ⓑ Pathway, patio
Ⓒ Hydraulic connection lines, indoor/outdoor unit
Ⓓ Indoor/outdoor unit Modbus cable and outdoor unit power cable: Route the cables so they are not stressed.
Ⓔ Openings in the base plate for free drainage of condensate: Never seal the openings.
Ⓕ Connection set, wall mounting (accessories)
Ⓖ Support for floorstanding installation (accessories)
Ⓗ Foundation strip
Ⓚ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
Ⓛ Flexible separating layer between the foundations and the building

Note

Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 99.

Floorstanding installation with support, line entry below ground level

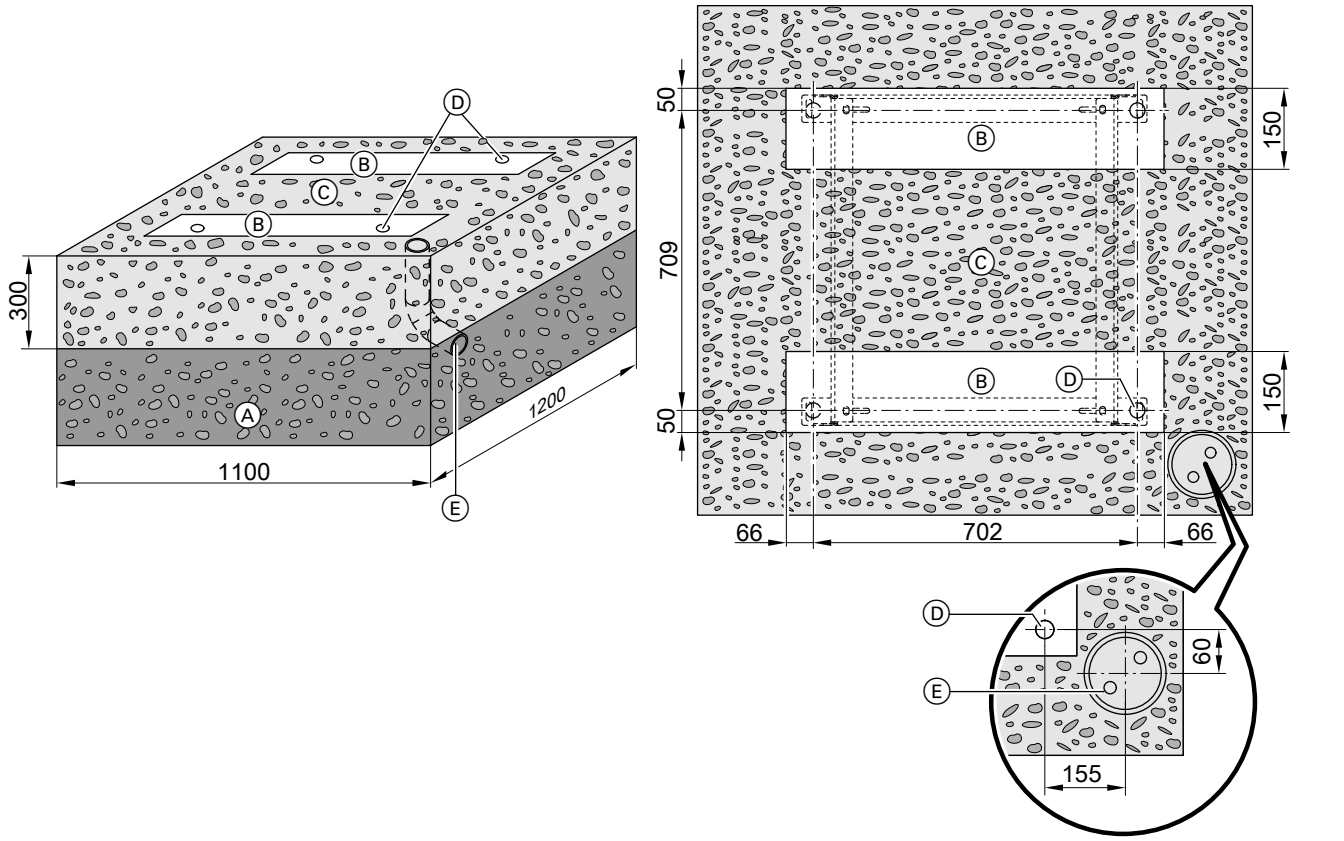


Ⓐ Ground
Ⓑ Pathway, patio
Ⓒ Support for floorstanding installation (accessories)
Ⓓ Openings in the base plate for free drainage of condensate: Never seal the openings.
Ⓔ Indoor/outdoor unit Modbus cable and outdoor unit power cable: Route the cables so they are not stressed.
Ⓕ Floorstanding installation connection set (accessories)
Ⓖ Hydraulic connection set (accessories)
Ⓗ Foundation strip
Ⓚ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations

Note
Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 99.

Foundations

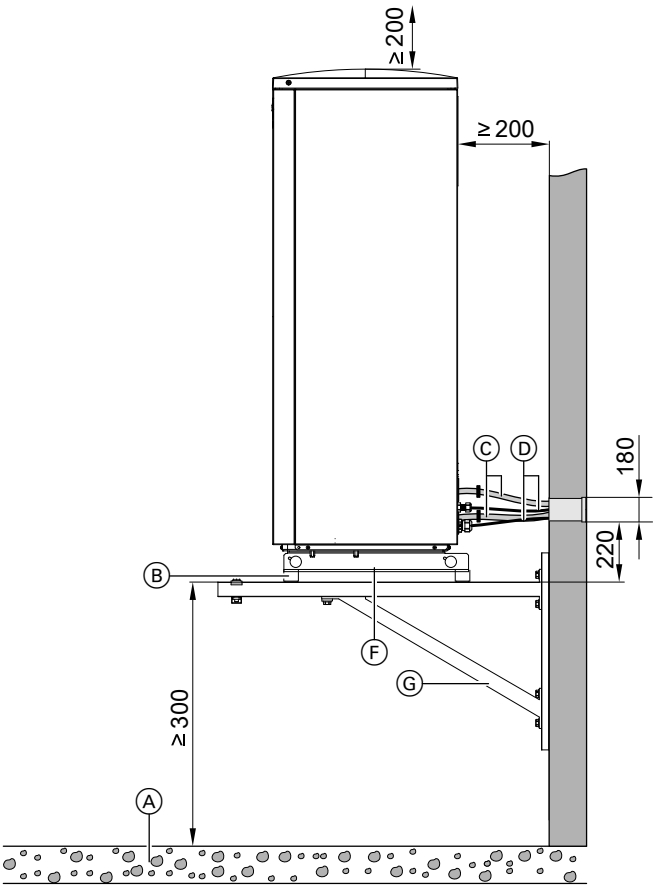
Fit the floor supports on 2 horizontal foundation strips. We recommend the construction of concrete foundations in accordance with the following diagram. The stated thickness of the layers represents an average value. These values should be adjusted to suit the local conditions. Follow the standard rules of building engineering.



Ⓐ Frost protection for foundations (compacted crushed stone, e.g. 0 to 32/56 mm); thickness of layer subject to local requirements and building regulations
Ⓑ Foundation strip
Ⓒ Gravel bed as condensate soakaway
Ⓓ Fixing points for floorstanding installation supports
Ⓔ Only for line entry below ground level: Hydraulic connection set (accessories)

Note
Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 99.

Wall mounting



Note
Provide thermal insulation of sufficient thickness on the pipework to the outdoor air: See table on page 99.

Ⓐ Gravel bed as condensate soakaway
Ⓑ Anti-vibration mounts (standard delivery of bracket)
Ⓒ Hydraulic connection lines, indoor/outdoor unit
Ⓓ Indoor/outdoor unit Modbus cable and outdoor unit power cable: Route the cables so they are not stressed.
Ⓔ Connection set, wall mounting (accessories)
Ⓕ Openings in the base plate for free drainage of condensate: Never seal the openings.
Ⓖ Bracket for wall mounting (accessories)

7.3 Siting the indoor unit

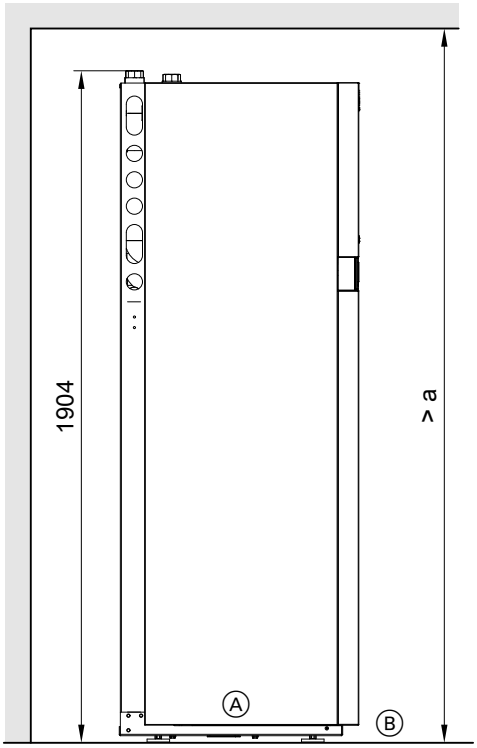
Installation room requirements

- Dry and protected against frost
  - Max. 70 % relative humidity, corresponding to an absolute humidity of approx. 25 g water vapour/kg dry air.
  - Ambient temperatures
    Wall mounted indoor unit: 5 to 35 °C
    Indoor unit with integral DHW cylinder: 0 to 35 °C
- Avoid dust, gases and vapours due to a risk of explosion in the installation room.

Installation requirements

- Provide a drain connection for the safety valve.
  Connect the safety valve drain hose to the public sewage system with a fall and a pipe vent.
- Provide shut-off equipment for the heating water flow and common heating water return/DHW cylinder return.

Minimum room height Vitocal 222-A

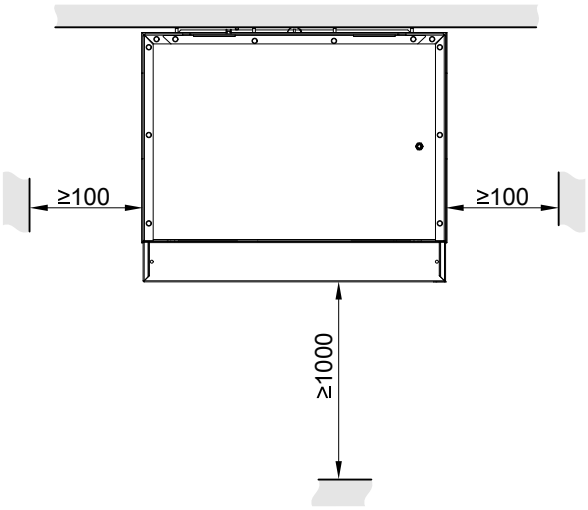


Minimum room height a depends on the hydraulic connection set used.

Hydraulic connection set	Minimum room height a in mm
– For installation on finished walls, for upward connection	2200
– For installation to the left or right on finished walls	2000

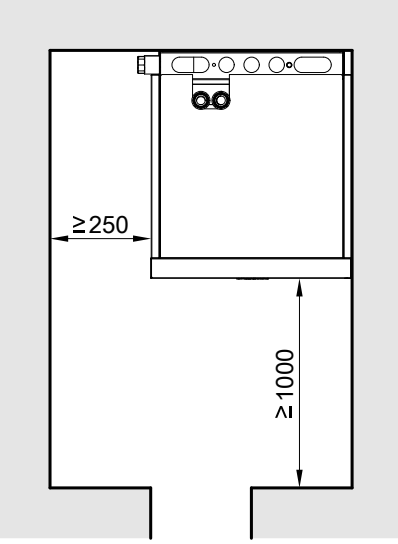
Ⓐ Indoor unit
Ⓑ Finished floor level or top edge of platform for unfinished floors

Minimum clearances Vitocal 200-A

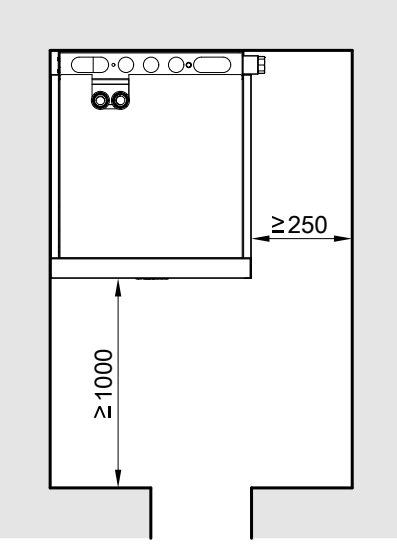


Minimum clearances Vitocal 222-A

Secondary circuit connections, left/top

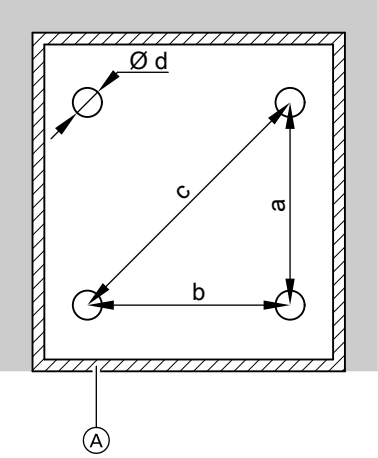


Secondary circuit connections, right/top



Installation in conjunction with Vitovent 300-F
See "Technical guide for ventilation systems with heat recovery".

Pressure points for Vitocal 222-A



Ⓐ Partition joint with edge insulation strip as part of the floor construction
a 439 mm
b 506 mm
c 670 mm
d 64 mm

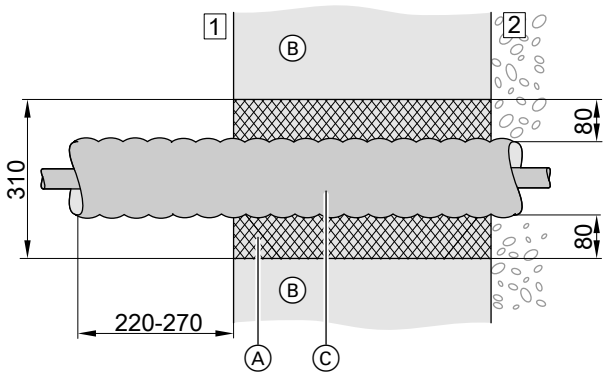
Note
- *Observe the permissible floor load.*
- *Level the appliance horizontally.*
- *If the adjustable feet are used to compensate for an uneven floor (max. 10 mm), distribute the pressure load on the individual feet evenly.*

The total weight with filled DHW cylinder is 384 kg.
Each pressure point (each with an area of 3217 mm^2) is subject to a load of up to 96 kg.

7.4 Connection between the indoor and outdoor units

Cable entry through the wall

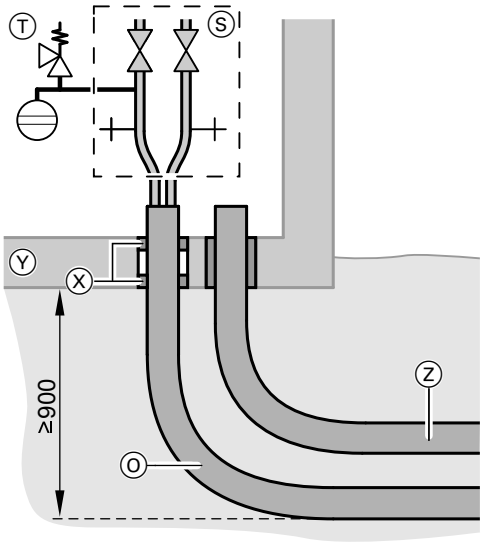
Suitable as wall sealing flange for brickwork



Ⓐ Expanding mortar
Ⓑ External wall
Ⓒ Hydraulic connection set (accessories)
1 Inside the building
2 Outside the building

Cable entry through the floor plate

Note
If the connections on the building side are positioned at ground level (see the diagram on the right) then we recommend that the required connection lines and inlets should be positioned ***before*** *the foundation slab is constructed.*
Any retrofitted installation will be very expensive.



Connections on the building side at ground level

Ⓞ Hydraulic connection set (accessory)
Ⓢ Drain & fill facility (for draining with compressed air)
Ⓣ Expansion vessel with safety assembly (accessories)
Ⓧ Moisture-proof and waterproof wall duct (on site)
Ⓨ Foundation slab of the building
Ⓩ DN 100 KG conduit for external connections, control unit/heat pump (on site, with state-of-the-art building seal)

7.5 Electrical connections

Electrical installation requirements

- Observe the technical connection requirements specified by your local power supply utility.
- Your local power supply utility will provide you with details regarding the required metering and switching equipment.
- Provide a separate electricity meter for the heat pump.

Mains voltage:

- The heat pumps operate with 230 V~ or 400 V~, depending on type:

Vitocal 200-A

Type	Compressor	
	230 V~	400 V~
AWO-M 201.A AWO-M-E 201.A AWO-M-E-AC 201.A	X	
AWO 201.A AWO-E 201.A AWO-E-AC 201.A		X

Vitocal 222-A

Type	Compressor	
	230 V~	400 V~
AWOT-M-E 221.A AWOT-M-E-AC 221.A	X	
AWOT-E 221.A AWOT-E-AC 221.A		X

The fan fuse/MCB is located in the outdoor unit.

- The instantaneous heating water heater (if installed) is operated at 400 V~ (or 230 V~). The instantaneous heating water heater is located in the indoor unit.
- The control circuit requires a power supply of 230 V~. The control circuit fuse (6.3 A) is located in the heat pump control unit in the indoor unit.

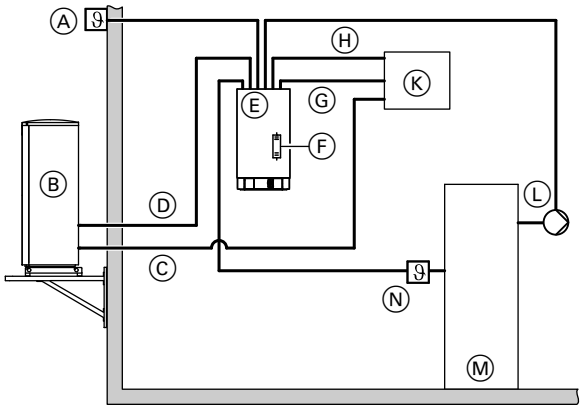
Power-OFF

It is possible for the power supply utility to shut down the compressor and instantaneous heating water heater (if installed). The ability to carry out such a shutdown may be a power supply utility requirement for providing a lower tariff.

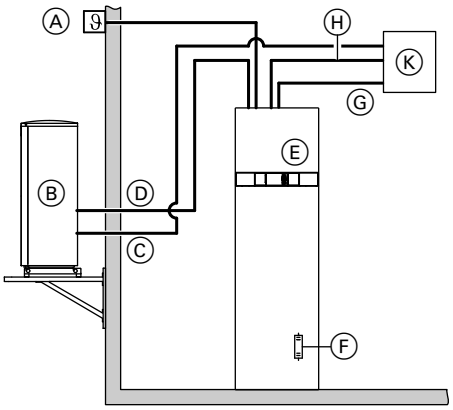
This must **not** shut off the power supply to the Vitotronic control unit.

Wiring diagram

Vitocal 200-A



Vitocal 222-A



Ⓐ Outside temperature sensor, sensor lead: 2 x 0.75 mm²
Ⓑ Outdoor unit
Ⓒ Compressor power cable, 230 V~ or 400 V~: See the following table
Ⓓ Bus cable indoor/outdoor unit (3 x 0.75 mm²)
Ⓔ Indoor unit
Ⓕ Instantaneous heating water heater
Ⓖ Power cable for instantaneous heating water heater: See following table.
Ⓗ Power cable for heat pump control unit: See following table.
Ⓚ Electricity meter/mains
Ⓛ Circulation pump for cylinder heating
Ⓜ DHW cylinder
Ⓝ Cylinder temperature sensor, sensor lead: 2 x 0.34 mm²

Note

For heating water buffer cylinder, heating circuit with mixer, external heat generator (gas/oil/wood etc.), allow for additional supply lines, control cables and sensor leads.

Check the core cross-section of the power cables and enlarge if required.

Design information (cont.)

Cable lengths in the indoor/outdoor unit

Vitocal 200-A

Cables		Indoor unit	Outdoor unit, types	
			201.A04 to A08	201.A10 to A16
Power cables	– Heat pump control unit 230 V~	1.2 m	—	—
	– Compressor 230 V~/400 V~	—	1.2 m	1.9 m
Other connecting cables	– 230 V~, e.g. for circulation pumps	1.2 m	—	—
	– < 42 V, e.g. for sensors	0.8 m	—	—
Bus cable for indoor/outdoor unit (accessories, 15 m or 30 m)	– Modbus	0.8 m	1.2 m	1.9 m

Vitocal 222-A

Cables		Indoor unit	Outdoor unit, types	
			221.A04 to A08	221.A10 to A16
Power cables	– Heat pump control unit 230 V~	1.2 m	—	—
	– Compressor 230 V~/400 V~	—	1.2 m	1.9 m
Other connecting cables	– 230 V~, e.g. for circulation pumps	1.2 m	—	—
	– < 42 V, e.g. for sensors	0.8 m	—	—
Modbus cable for indoor/outdoor unit (accessories, 15 m or 30 m)	– Modbus	0.8 m	1.2 m	1.9 m

Recommended flexible power cables

Indoor units Vitocal 200-A and Vitocal 222-A (all types)

Power supply		Cable	Max. cable length
Heat pump control unit 230 V~	– Without power-OFF	3 x 1.5 mm²	
	– With power-OFF	5 x 1.5 mm²	
Instantaneous heating water heater	– 400 V~	5 x 2.5 mm²	25 m
	– 230 V~	7 x 2.5 mm²	25 m

Outdoor units, Vitocal 200-A

Vitocal 200-A	Type		Cable	Max. cable length
230 V appliances	– AWO-M – AWO-M-E – AWO-M-E-AC	201.A04	3 x 2.5 mm²	29 m
		201.A06	3 x 2.5 mm²	29 m
		201.A08	3 x 2.5 mm²	29 m
		201.A10	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
		201.A13	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
		201.A16	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
400 V appliances	– AWO – AWO-E – AWO-E-AC	201.A10	5 x 2.5 mm²	30 m
		201.A13	5 x 2.5 mm²	30 m
		201.A16	5 x 2.5 mm²	30 m

7

5831388

Outdoor units, Vitocal 222-A

Vitocal 222-A	Type		Cable	Max. cable length
230 V appliances	– AWOT-M-E – AWOT-M-E-AC	221.A04	3 x 2.5 mm²	29 m
		221.A06	3 x 2.5 mm²	29 m
		221.A08	3 x 2.5 mm²	29 m
		221.A10	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
		221.A13	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
		221.A16	3 x 2.5 mm²	20 m
			or	
			3 x 4.0 mm²	32 m
400 V appliances	– AWOT-E – AWOT-E-AC	221.A10	5 x 2.5 mm²	30 m
		221.A13	5 x 2.5 mm²	30 m
		221.A16	5 x 2.5 mm²	30 m

7.6 Noise generation

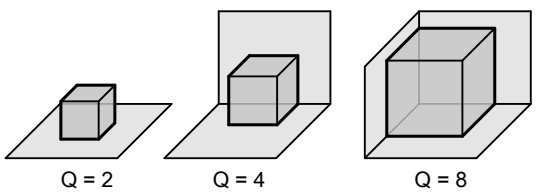
Principles

Sound power level L_W
This describes the entire sound emissions in all directions emanating from the heat pump. It does **not** depend on the surrounding conditions (reflections) and is a value that can be used for direct comparisons of sound sources (heat pumps).

Sound pressure level L_P
The sound pressure level is a measure to assist orientation regarding the volume of noise perceived by the ear at a specific location. The sound pressure level is substantially influenced by the distance and ambient conditions. The sound pressure level is thus dependent on the measuring location, which is often at a distance of 1 m. Standard measuring microphones measure the sound pressure directly.
The sound pressure level is the variable that is used to assess immissions from individual systems.

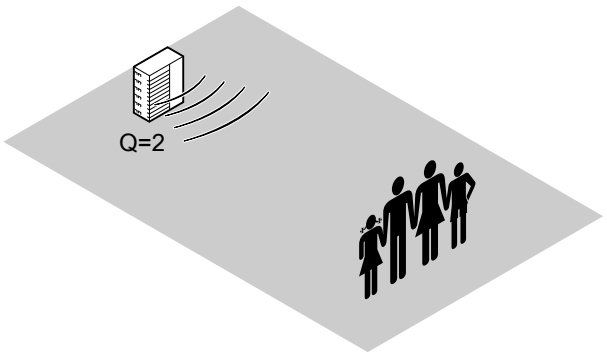
Sound reflection and sound pressure level (directivity Q)

The sound pressure level increases exponentially with the number of adjacent, vertical, fully reflective surfaces (e.g. walls) compared to installation in a free field (Q = directivity), as sound projection is restricted compared to installation in a free field.

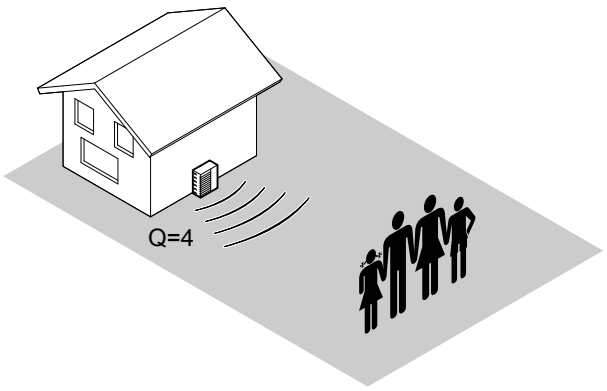


Q Directivity

Q=2: Freestanding outdoor unit at a large distance from the building

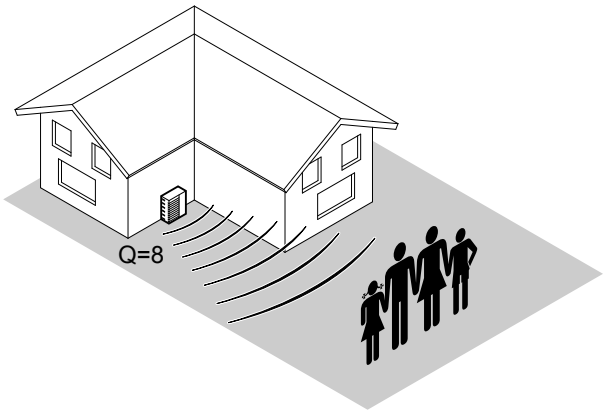


Q=4: Outdoor unit close to a house wall



Design information (cont.)

Q=8: Outdoor unit close to a house wall, next to a projecting wall corner



The following table shows the extent to which the sound pressure level L_P changes according to directivity Q and the distance from the appliance in relation to the sound power level L_W measured directly at the appliance or at the air discharge.

The values listed in the table were calculated according to the following formula:

$$L = L_W + 10 \cdot \log \left(\frac{Q}{4 \cdot \pi \cdot r^2} \right)$$

L = Sound level at the receiver
L_W = Sound power level at the sound source
Q = Directivity
r = Distance between receiver and sound source

The legal requirements concerning sound propagation apply under the following idealised conditions:
- The sound source is a point source of sound.
- Installation and operating conditions for the heat pump correspond to the conditions when determining the sound power.
- At Q=2, sound is emitted in a free field, no surrounding reflective objects/buildings.
- At Q=4 and Q=8, full reflection on adjacent surfaces is assumed.
- Unrelated noise from other surrounding sources is not taken into account.

Directivity Q, calculated on site	**Distance from the sound source in m**								
	1	**2**	**4**	**5**	**6**	**8**	**10**	**12**	**15**
	Energy-equivalent duration of sound pressure level L_P of the heat pump in relation to the sound power level L_W measured at the appliance/air duct in dB(A)								
2	–8.0	–14.0	–20.0	–22.0	–23.5	–26.0	–28.0	–29.5	–31.5
4	–5.0	–11.0	–17.0	–19.0	–20.5	–23.0	–25.0	–26.5	–28.5
8	–2.0	–8.0	–14.0	–16.0	–17.5	–20.0	–22.0	–23.5	–25.5

Note
- *In practice, actual values may differ from those shown here due to sound reflection or sound absorption as a result of local conditions. Therefore, the situations described by Q=4 and Q=8, for example, often give only an approximate picture of the actual conditions at the emission site.*
- *If the heat pump sound pressure level as calculated approximately from the table is less than 3 dB(A) different from the permissible standard value given by the TA Lärm, a precise sound immissions prognosis must be produced (consult an acoustic engineer).*

Standard values for assessing the sound pressure level to TA Lärm (measured outside the building)

Area/object[*14]	**Standard immissions value (sound pressure level) in dB(A)**[*15]	
	During the day	At night
Area with a mix of commercial installations and residential units where neither commercial installations nor residential units dominate.	60	45
Areas with predominantly residential units.	55	40
Areas with only residential units.	50	35
Residential units that are structurally connected to the heat pump system	40	30

Note
- *Sound emission (TA-Lärm) regulations must be observed [in Germany].*
- *When siting the heat pump, always take into account the distances to neighbouring property in accordance with local building regulations.*

*[*14] Determined according to outline planning restrictions; check with local authorities.*

*[*15] Valid for the sum of all sounds that have an influence.*

5831388

Sound pressure level at different distances to the appliance

Outdoor unit types 201.A04 and 221.A04, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	50	2	42	36	30	28	26	24	22	20	18
		4	45	39	33	31	29	27	25	23	22
		8	48	42	36	34	32	30	28	26	25
Max.	56	2	48	42	36	34	32	30	28	26	24
		4	51	45	39	37	35	33	31	29	28
		8	54	48	42	40	38	36	34	32	31

Outdoor unit types 201.A06 and 221.A06, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	50	2	42	36	30	28	26	24	22	20	18
		4	45	39	33	31	29	27	25	23	22
		8	48	42	36	34	32	30	28	26	25
Max.	56	2	48	42	36	34	32	30	28	26	24
		4	51	45	39	37	35	33	31	29	28
		8	54	48	42	40	38	36	34	32	31

Outdoor unit types 201.A08 and 221.A08, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	50	2	42	36	30	28	26	24	22	20	18
		4	45	39	33	31	29	27	25	23	22
		8	48	42	36	34	32	30	28	26	25
Max.	58	2	50	44	38	36	34	32	30	28	26
		4	53	47	41	39	37	35	33	31	30
		8	56	50	44	42	40	38	36	34	33

Outdoor unit types 201.A10 and 221.A10, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	60	2	52	46	40	38	36	34	32	30	28
		4	55	49	43	41	39	37	35	33	32
		8	58	52	46	44	42	40	38	36	35

Outdoor unit types 201.A10 and 221.A10, 400 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	61	2	53	47	41	39	37	35	33	31	29
		4	56	50	44	42	40	38	36	34	33
		8	59	53	47	45	43	41	39	37	36

*16 *Total sound power level measurement performed with reference to EN ISO 12102/EN ISO 9614-2, accuracy category 2 under the following conditions: A 7$^{\pm 3\,K}$/W 55$^{\pm 2\,K}$*

*17 *Determined by calculation on the basis of the actual effective total sound power level, in accordance with the formula in chapter "Principles"*

Design information (cont.)

Outdoor unit types 201.A13 and 221.A13, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	61	2	53	47	41	39	37	35	33	31	29
		4	56	50	44	42	40	38	36	34	33
		8	59	53	47	45	43	41	39	37	36

Outdoor unit types 201.A13 and 221.A13, 400 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	61	2	53	47	41	39	37	35	33	31	29
		4	56	50	44	42	40	38	36	34	33
		8	59	53	47	45	43	41	39	37	36

Outdoor unit types 201.A16 and 221.A16, 230 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	61	2	53	47	41	39	37	35	33	31	29
		4	56	50	44	42	40	38	36	34	33
		8	59	53	47	45	43	41	39	37	36

Outdoor unit types 201.A16 and 221.A16, 400 V~

Fan speed	Sound power level L_W in dB(A)*16	Directivity Q	Distance from the outdoor unit in m								
			1	2	4	5	6	8	10	12	15
			Sound pressure level L_P in dB(A)*17								
Night	55	2	47	41	35	33	31	29	27	25	23
		4	50	44	38	36	34	32	30	28	27
		8	53	47	41	39	37	35	33	31	30
Max.	61	2	53	47	41	39	37	35	33	31	29
		4	56	50	44	42	40	38	36	34	33
		8	59	53	47	45	43	41	39	37	36

Note

In practice, actual values may differ from those shown here due to sound reflection or absorption as a result of local conditions. Therefore, the situations described by Q=4 and Q=8, for example, often give only an approximate picture of the actual conditions at the emission site.

7

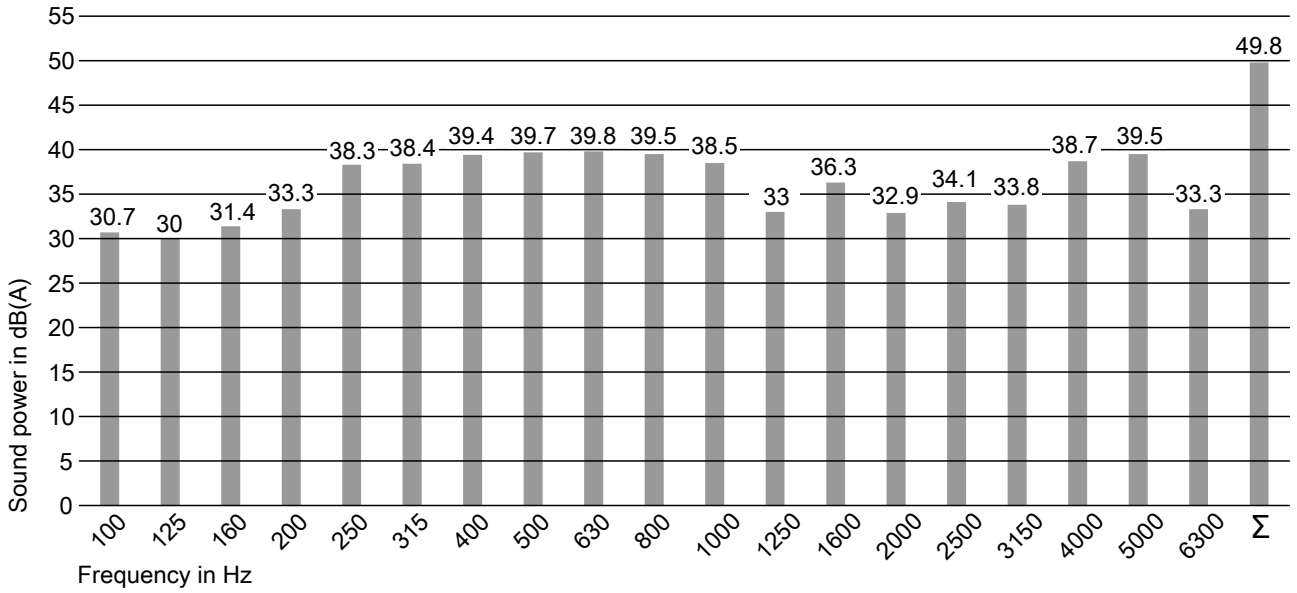
16 Total sound power level measurement performed with reference to EN ISO 12102/EN ISO 9614-2, accuracy category 2 under the following conditions: A $7^{\pm 3\,K}$/W $55^{\pm 2\,K}$

17 Determined by calculation on the basis of the actual effective total sound power level, in accordance with the formula in chapter "Principles"

5831388

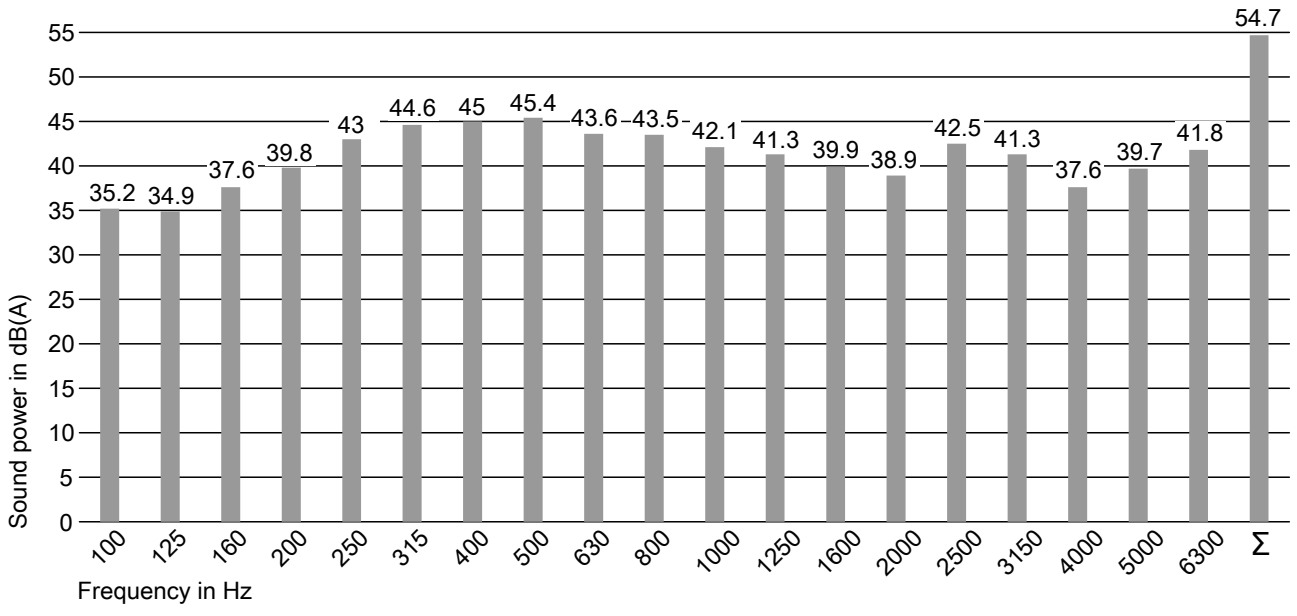
Quieter operation: Sound power level in frequency spectrum

Outdoor unit types 201.A04 to A08 and 221.A04 to A08, 230 V~



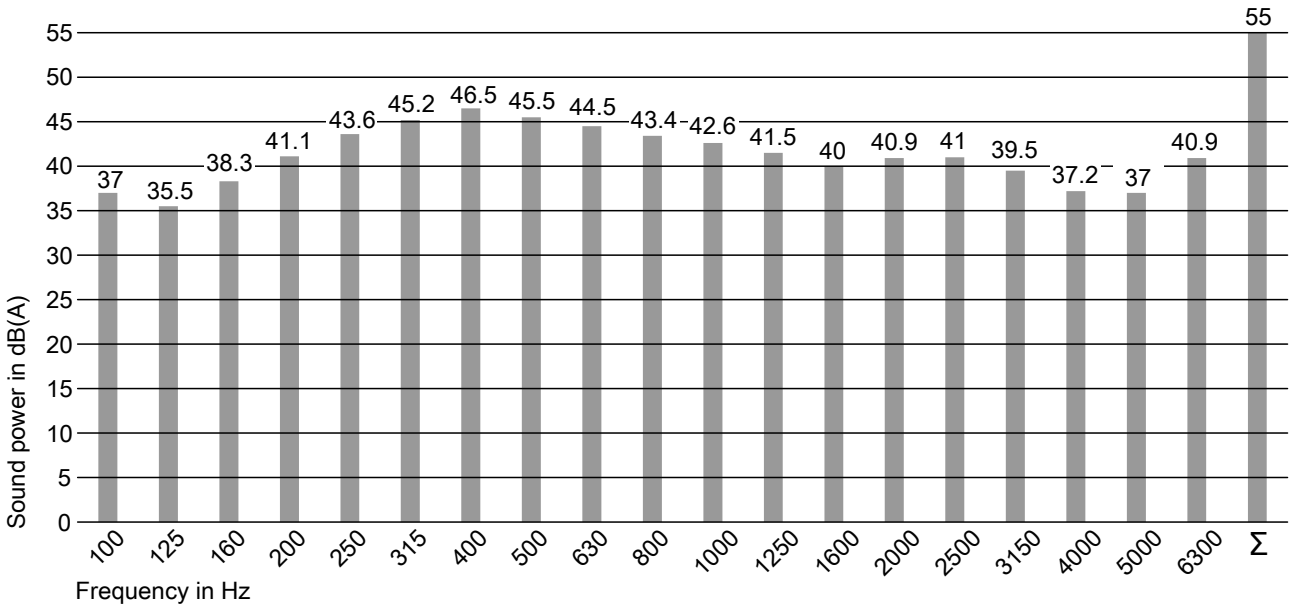
Σ Total sound power level

Outdoor unit types 201.A10 to A16 and 221.A10 to A16, 230 V~



Σ Total sound power level

Outdoor unit types 201.A10 to A16 and 221.A10 to A16, 400 V~



Σ Total sound power level

Increase of sound power level for heat pump cascades

In heat pump cascades, the sound power level L_W increases in relation to the number of individual units. If outdoor units with equal output are used, the following increases in sound power level may be assumed:

	Number of outdoor units with equal output			
	2	**3**	**4**	**5**
Increase of sound power level L_W in dB(A)	3	5	6	7

Example:
Cascade of 4 outdoor units Vitocal 200-A, type AWO 201.A10:
- Max. sound power level L_W of individual unit: 61 dB(A)
- Increase for 4 outdoor units: 6 dB(A)
- Max. sound power level L_W of cascade: 67 dB(A)

Information on reducing noise emissions

- Never site the heat pump directly next to living rooms, bedrooms or their windows.
- When routing pipes through ceilings and walls, prevent the transmission of structure-borne noise through suitable insulation materials. See information on siting the indoor unit from page 105.
- Never position the heat pump immediately next to neighbouring buildings or properties. See information on siting the outdoor unit from page 99.
- The sound pressure level may be increased if the heat pump is installed in unfavourable physical positions.
  In this context, please observe the following:
  – Avoid surroundings with hard reflecting floors (e.g. concrete or paving), as the sound pressure level can be increased through reflection. Surroundings that are covered with vegetation (e.g. a lawn) can noticeably reduce the perceived sound pressure level.
  – The heat pump should preferably be freestanding: See the "Heat pump principles" technical guide.
- If the requirements of TA Lärm [Germany] are not observed, suitable building measures (e.g. additional planting) must be employed to reduce the sound pressure level to acceptable levels: See the "Heat pump principles" technical guide.

7.7 Sizing the heat pump

First establish the standard heat load Φ_{HL} of the building. For discussions with customers and for the preparation of a quotation, in most cases estimating the heat load is adequate.

As with all heating systems, determine the standard heat load of the building to EN 12831 before ordering the appropriate heat pump.

Mono mode operation

According to EN 12831, the heat pump system in mono mode must, as sole heat source, be able to cover the entire heat demand of the building.
For mono mode operation, the potential outside temperatures at the installation site and the heat pump application limits must be taken into account:
For minimum air inlet temperature and minimum flow temperature, see chapter "Application limits to EN 14511".
Please also note that, in mono mode, the heat pump heating output and the maximum secondary circuit flow temperature are influenced by the outside temperature. This can result in comfort losses, for DHW heating in particular.

Therefore please note the following design points:
- Check whether the maximum heat pump flow temperature, achieved at the prevailing outside temperatures, fulfils the local DHW heating requirements.
- During commissioning or service, the secondary circuit temperature may lie below the required minimum heat pump flow temperature. The heat pump compressor does not then run independently.
- If frost protection mode is permanently enabled (e.g. in a holiday home), the secondary circuit temperature can drop below the minimum heat pump flow temperature. The heat pump compressor does not then run independently.

As a result, even with a mono mode heat pump design, an additional heat generator must always be included in the design; e.g. an instantaneous heating water heater.
If the heat pump **cannot** meet the heat demand in mono mode, then the heat pump must be operated in **mono energetic mode** (with instantaneous heating water heater) or in **dual mode** (with external heat generator). Otherwise you run the risk of the condenser icing up, causing significant damage to the heat pump.

Note
Depending on type, the instantaneous heating water heater is either integrated in the heat pump or available as an accessory.
See chapter "Installation accessories".

Sizing is of particular relevance to heat pump systems that are to be operated in mono mode, since oversized equipment frequently incurs disproportionate system costs. Therefore avoid oversizing!

When sizing the heat pump, observe the following:
- Take into account supplements to the heat load of the building to cover power-OFF periods. [In Germany] the power supply utility may interrupt the power supply of heat pumps for up to 3 x 2 hours within a period of 24 hours.
  Observe additional individual arrangements for customers with special tariffs.
- The building inertia means that 2 hours of power-OFF time are not taken into consideration.

Note
The ON periods between 2 power-OFF times must be at least as long as the preceding power-OFF time.

Estimate of the heat load based on the heated area
The heated surface area (in m^2) is multiplied by the following specific heat demand:

Passive house	10 W/m^2
Low energy house	40 W/m^2
New build (to EnEV)	50 W/m^2
House (built prior to 1995 with standard thermal insulation)	80 W/m^2
Older house (without thermal insulation)	120 W/m^2

Theoretical sizing with power-OFF time of 3 × 2 hours or when used in Smart Grid
Example:
Low energy house (40 W/m^2) and a heated area of 180 m^2
- Estimated heat load: 7.2 kW
- Maximum blocking time of 3 × 2 hours at a minimum outside temperature in accordance with EN 12831

24 h, therefore, result in a daily heat volume of:
- 7.2 kW · 24 h = 173 kWh

To cover the maximum daily heat volume, only 18h/day are available on account of the times when the power supply is blocked. The building inertia means that 2 hours of the period during which power is blocked are not taken into consideration.
- 173 kWh / (18 + 2) h = 8.65 kW

In other words, the heat pump heating output would need to be increased by 20 % if the power supply were blocked for a maximum of 3 × 2 hours per day.
Frequently, blocking times are only invoked if there is a need to do so. Please contact the customer's power supply utility to enquire about blocking times.

Supplement for DHW heating in mono mode operation

Note
In dual mode operation of the heat pump, the heating output available is generally so high that this supplement does not need to be taken into consideration.

For a general residential building, a max. DHW demand of approx. 50 l per person per day at approx. 45 °C is assumed.
- This demand represents an additional heat load of approx. 0.25 kW per person given a heat-up time of 8 h.
- This supplement will only be taken into consideration if the sum total of the additional heat load exceeds 20 % of the heat load calculated to EN 12831.

	DHW demand at a DHW temperature of 45 °C in l per person/day	Specific available heat in Wh per person/day	Recommended heat load supplement for DHW heating*18 in kW/person
Low demand	15 to 30	600 to 1200	0.08 to 0.15
Standard demand*19	30 to 60	1200 to 2400	0.15 to 0.30

or

	Reference temperature 45 °C in l per person/day	Specific available heat in Wh per person/day	Recommended heat load supplement for DHW heating*18 in kW/person
Apartment (billing according to demand)	30	approx. 1200	approx. 0.150
Apartment (flat rate billing)	45	approx. 1800	approx. 0.225
Detached house*19 (average demand)	50	approx. 2000	approx. 0.250

Supplement for setback mode

As the heat pump control unit is equipped with a temperature limiter for setback mode, the supplement for setback mode to EN 12831 can be ignored.
In addition, the control unit is equipped with start optimisation, which means that there is also no need for a supplement for heating up from setback mode.

Both functions must be enabled in the control unit. If any of the supplements are omitted because of the activated control unit functions then this must be documented when the system is handed over to the operator.
If, irrespective of the above mentioned control options, these supplements are nevertheless to be taken into account, the calculation should be made with reference to EN 12831.

Mono energetic operation

In heating operation, the heat pump system is supported by an instantaneous heating water heater, which is either integrated or available as an accessory. The control unit switches the instantaneous heating water heater on, subject to the outside temperature (dual mode temperature) and heat load.

Note
*That part of the electric power drawn by the instantaneous heating water heater will generally **not** be charged at special tariffs.*

Sizing of typical system configurations:
- Size the heating output of the heat pump approx. 70 to 85 % of the max. required building heat load to EN 12831.
- The heat pump covers approx. 95 % of the annual heat load.
- Blocking periods must not be taken into consideration.

Note
Compared to mono mode operation, the heat pump will run for longer due to its smaller size.

Dual mode operation

External heat source
The heat pump control unit enables dual mode operation of the heat pump with an external heat generator, e.g. oil boiler.
The external heat source is hydraulically connected in such a way that the heat pump can also be used as a return temperature raising facility for the boiler. System separation is provided with either a low loss header or a heating water buffer cylinder. For optimum heat pump operation, the external heat source must be integrated via a mixer into the heating water flow. Direct activation of this mixer by the heat pump control unit results in a quick response.
The control unit enables operation of the external heat generator if the outside temperature (long term average) is below the dual mode temperature. Above the dual mode temperature, the external heat generator only starts under the following conditions:
- The heat pump fails to start due to a fault.
- There is a special heat demand, e.g. frost protection.

The external heat source can also be enabled for DHW heating.

Note
*The heat pump control unit does **not** contain any safety functions for the external heat source. To prevent excessive temperatures in the heat pump flow and return in case of a fault, high limit safety cut-outs must be provided to stop the external heat generator (switching threshold 70 °C).*

Sizing the heat pump for **dual mode parallel** operation:
- Size the heating output of the heat pump to approx. 70 to 85 % of the maximum required building heat load to EN 12831.
- The heat pump covers approx. 95 % of the annual heat load.
- Blocking times do not need to be taken into consideration.

Note
The reduced size of the heat pump, compared to mono mode operation, means that the runtime will increase.

Determining the dual mode point

Air/water heat pumps are predominantly operated in **mono energetic** mode. At low outside temperatures, the heat pump heating output falls, but at the same time the heat demand rises.

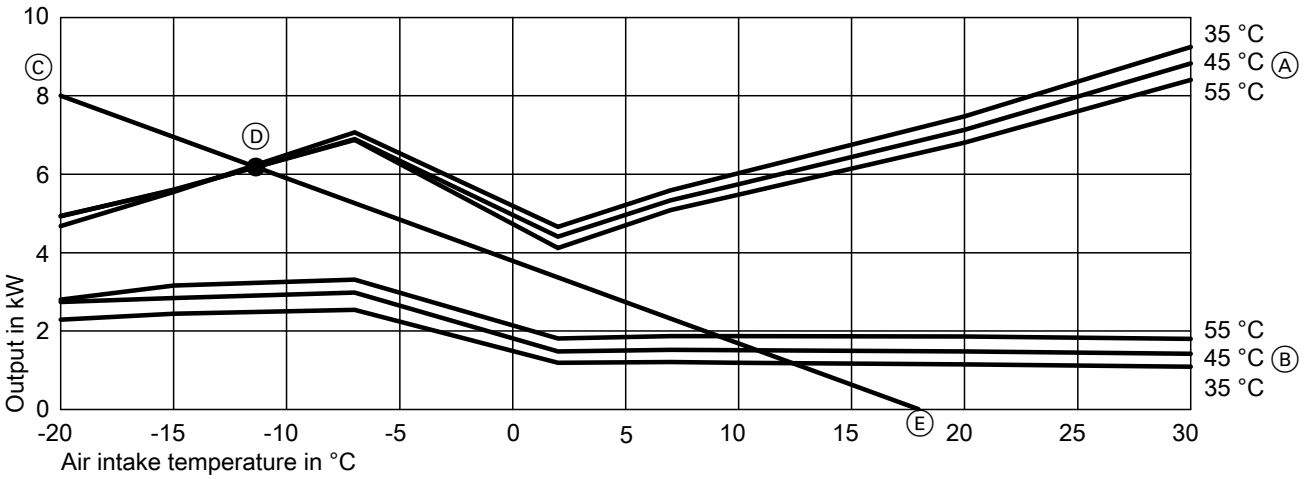
For operation in mono mode, very large systems would be required and the heat pump would be oversized for the majority of the runtime.

**18 With a DHW cylinder heat-up time of 8 h.*

**19 Select a higher supplement if the actual DHW demand exceeds the stated values.*

Above the dual mode point (e. g. –11 °C), the heat pump covers the entire heat load. Below the dual mode point, the heat pump increases the return temperature of the heating system and an instantaneous heating water heater in the heating flow provides additional heating.

The system is sized in accordance with the performance diagrams.



Curves subject to the flow temperature:

Ⓐ Heating output at flow temperatures of 35 °C, 45 °C, 55 °C
Ⓑ Power consumption for heating at flow temperatures 35 °C, 45 °C, 55 °C
Ⓒ Heat load
Ⓓ Dual mode point
Ⓔ Heating limit temperature

Example:

Heat load to EN 12831:		8 kW
Minimum outside temperature:		–20 °C
Heating limit temperature:		18 °C
Maximum flow temperature:		55 °C
Selected:	Air/water heat pump Vitocal 200-A, type AWO-M-E-AC 201.A08	

As can be seen on the performance diagram, the dual mode point is at –11 °C at an output of approx. 6.1 kW.

7.8 Hydraulic conditions for the secondary circuit

Minimum flow rate and minimum system volume

For trouble-free operation, heat pumps require a **minimum flow rate** in the secondary circuit.
In order to ensure the minimum runtimes for the heat pump, a **minimum system volume** in the secondary circuit must also be considered. If the system volume is too small, the heat pump may switch on and off too frequently if heat consumption in the building is low (cycling).
There must be no means of shutting off the minimum system volume. The heating circuits that can be shut off via thermostatic valves must therefore not be included in the calculation.

Values for minimum flow rate and minimum system volume
Values must be strictly observed: See tables on page 120.

In heat pumps with output control the heat transfer adjusts to the building's heat load, which enables reduced cyclical operation in the partial load range.
Even with these heat pumps, however, the minimum system volume must be available when the heat demand in the building is very low, e.g. towards the end of spring.

Providing the necessary defrost energy
Viessmann air/water heat pumps defrost efficiently by reversing the refrigerant circuit. The defrost energy is taken from the secondary circuit for a short period of time. To ensure the safe and long lasting operation of the heat pump, a sufficiently high system volume must be available to provide the defrost energy.

Systems with a heating water buffer cylinder connected in parallel

Heating water buffer cylinders connected in parallel to the heat pump ensure a sufficient minimum system volume in the secondary circuit. Hydraulic separation of the heating circuits also ensures the minimum flow rate of the heat pump, regardless of the hydraulic conditions in the heating circuits.

Benefits
- Hydraulic separation of the heat pump from the heating circuits ensures a constant flow rate through the heat pump.
  For example, if the heating circuit flow rate is reduced via thermostatic valves, the flow rate through the heat pump remains constant.
- Due to the low pressure drop to the heating water buffer cylinder, the secondary pump can be made smaller.
- Heating circuits with mixer can be supplied with a different flow temperature to a heating circuit without mixer.
- Additional heat generators can be integrated into the system, e.g. solar central heating backup.
- Bridging power-OFF periods:
  Subject to the electricity tariff, heat pumps can be switched off at peak times by the power supply utility. The buffer cylinder supplies the heating circuits including during this power-OFF time.
- The large buffer volume is used to extend the runtime of the heat pump. This avoids frequently switching the heat pump on and off (cycles).
- Due to the high energy content, a heating water buffer cylinder always provides the required defrost energy for the heat pump.

Implementation instructions
- When sizing the heating water buffer cylinder, note whether underfloor heating circuits and/or radiator heating circuits are connected.
- Due to the large volume of water and possible separate shut-off equipment for the heat generator, allow for a second or a larger expansion vessel.
- Set up the safety equipment for the system according to EN 12828.
- The volumetric flow rate of the secondary pump must be greater than that of the heating circuit pumps.
- In conjunction with an underfloor heating circuit, a temperature limiter must be installed to limit the maximum temperature of underfloor heating (part no. 7151728 or 7151729).

Sizing for underfloor heating on the ground floor and radiators in the attic
A heating water buffer cylinder of at least 200 l is required to prevent the heating circuits cooling down completely.
Connect the heating water buffer cylinder to the secondary circuit flow, in parallel with the heat pump (do not connect to the return).

Sizing for radiators (100 %)
A heating water buffer cylinder with a capacity of 200 l is required.

Systems with heating water buffer cylinder connected in series

In systems with a heating water buffer cylinder connected in series the required minimum system volume can be ensured. This type of heating water buffer cylinder is integrated into the secondary circuit return.

Benefits
- The large buffer volume is used to extend the runtime of the heat pump. This avoids frequently switching the heat pump on and off (cycles).
- Due to the high energy content, a heating water buffer cylinder always provides the required defrost energy for the heat pump.

Implementation instructions
- An overflow valve **must** be integrated in the heating circuit to ensure that the additional system volume is always available even in sealed unvented heating circuits.
  The flow rate of the overflow valve must be selected to ensure the minimum flow rate of the heat pump.
- Set up the safety equipment for the system according to EN 12828.
- In conjunction with an underfloor heating circuit, a temperature limiter must be installed to limit the maximum temperature of underfloor heating (part no. 7151728 or 7151729).

Systems without heating water buffer cylinder

In systems without a heating water buffer cylinder, trouble-free operation of the heat pump is only ensured if the following conditions are met:
- The minimum flow rate and the minimum system volume of the heat pump are ensured at all times.
- To avoid any loss of comfort caused by blocking periods, set up the heat pump power supply without power-OFF.

Implementation instructions

Take the following measures to ensure that the minimum flow rate of the heat pump is always available even in sealed unvented heating circuits:
- Fit an overflow valve in the heating circuit.
  The flow rate of the overflow valve must be selected to ensure the minimum flow rate of the heat pump.
- Keep parts of the heat distribution system open:
  Observe the relevant national regulations and/or Energy Savings Ordinance. The consent of the system user is required.
- In conjunction with an underfloor heating circuit, a temperature limiter must be installed to limit the maximum temperature of underfloor heating (part no. 7151728 or 7151729).

7.9 Planning aids for the secondary circuit

The required minimum flow rate and the minimum system volume must always be guaranteed. The following tables give an overview of which components can be used to achieve this:
- Secondary circuit pipework
- Heating water buffer cylinder connected in parallel to the heat pump
- Heating water buffer cylinder connected in series to the secondary circuit return

Vitocal 200-A, 230 V appliances

Type		$\dot{V}_{min}$ in l/h	$\varnothing_{pipes}$	V_{min} in l*20	Without buffer cylinder	Buffer cylinder (recommended minimum)		
						⫴	◎	⫴ + ◎
– AWO-M – AWO-M-E – AWO-M-E-AC	201.A04	700	DN 25	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A06	700	DN 25	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A08	700	DN 25	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A10	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A13	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A16	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l

Vitocal 200-A, 400 V appliances

Type		$\dot{V}_{min}$ in l/h	$\varnothing_{pipes}$	V_{min} in l*20	Without buffer cylinder	Buffer cylinder (recommended minimum)		
						⫴	◎	⫴ + ◎
– AWO – AWO-E – AWO-E-AC	201.A10	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A13	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	201.A16	1400	DN 32	50	X	Vitocell 100-E 46 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l

Heating water buffer cylinder in the heat pump return (connected in series)

Icons:
X Possible
$\dot{V}_{min}$ Minimum flow rate, secondary circuit

$\varnothing_{pipes}$ Minimum diameter of pipes in secondary circuit
V_{min} Minimum volume of the heating system
⫴ Underfloor heating circuit
◎ Radiator heating circuit

Vitocal 222-A, 230 V appliances

Type		$\dot{V}_{min}$ in l/h	$\varnothing_{pipes}$	V_{min} in l*20	Without buffer cylinder	Buffer cylinder (recommended minimum)		
						⫴	◎	⫴ + ◎
– AWOT-M-E – AWOT-M-E-AC	221.A04	700	DN 25	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A06	700	DN 25	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A08	700	DN 25	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A10	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A13	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A16	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l

Vitocal 222-A, 400 V appliances

Type		$\dot{V}_{min}$ in l/h	$\varnothing_{pipes}$	V_{min} in l*20	Without buffer cylinder	Buffer cylinder (recommended minimum)		
						⫴	◎	⫴ + ◎
– AWOT-E – AWOT-E-AC	221.A10	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A13	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l
	221.A16	1400	DN 32	40*21/50	X	Vitocell 100-E 40 l	Vitocell 100-E 200 l	Vitocell 100-E 200 l

Heating water buffer cylinder in the heat pump return (connected in series)

Icons:
X Possible
$\dot{V}_{min}$ Minimum flow rate, secondary circuit

$\varnothing_{pipes}$ Minimum diameter of pipes in secondary circuit
V_{min} Minimum volume of the heating system
⫴ Underfloor heating circuit
◎ Radiator heating circuit

*20 *Cannot be fitted with shut-off devices*

*21 *In conjunction with Vitocell 100-E, type SVPA, part no. ZK03801*

Pipework volume

Pipe	Nominal diameter	Dimension x wall thickness in mm	Volume in l/m
Copper pipe	DN 25	28 x 1	0.53
	DN 32	35 x 1	0.84
	DN 40	42 x 1	1.23
	DN 50	54 x 2	2.04
	DN 60	64 x 2	2.83
Threaded pipes	1	33.7 x 3.25	0.58
	1 ¼	42.4 x 3.25	1.01
	1 ½	48.3 x 3.25	1.37
	2	60.3 x 3.65	2.21
Composite pipes	DN 25	32 x 3	0.53
	DN 32	40 x 3.5	0.86
	DN 40	50 x 4.0	1.39
	DN 50	63 x 6.0	2.04
Hydraulic connection lines	DN 32	40 x 3.7	0.84
	DN 40	50 x 4.6	1.31

Note
If the heat pump is also used for cooling, the heating water flow and heating water return must be thermally insulated with vapour diffusion-proof material.

Further hydraulic data

Circulation pump	Factory-fitted
Residual heads with integral circulation pump	See page 55.

7.10 Water quality

Heating water

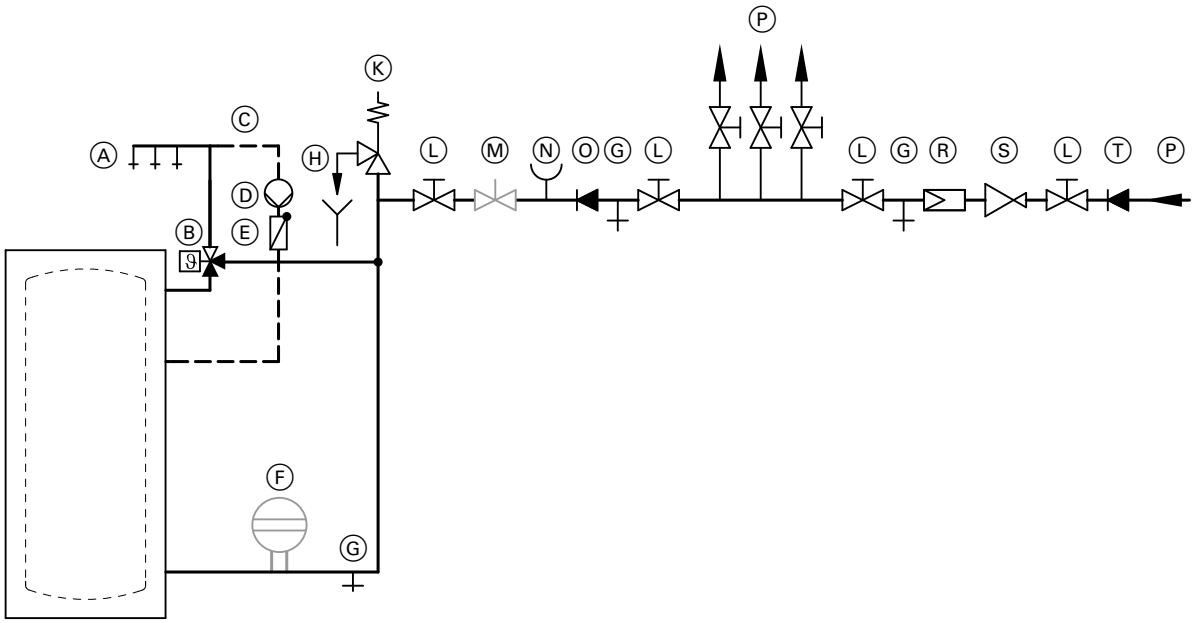
Unsuitable fill and top-up water increases the level of deposits and corrosion. This can lead to system damage.
Hard water can also cause damage to the instantaneous heating water heater in particular.
Observe VDI 2035 regarding quality and amount of heating water, including fill and top-up water.

- Flush the heating system thoroughly before filling.
- Only fill with water of potable quality.
- Only fill and operate appliances that have an instantaneous heating water heater with softened water.

7.11 Connection on the DHW side

For connecting the DHW side, observe EN 806, DIN 1988 and DIN 4753 (CH: SVGW regulations). Observe other country-specific standards as applicable.

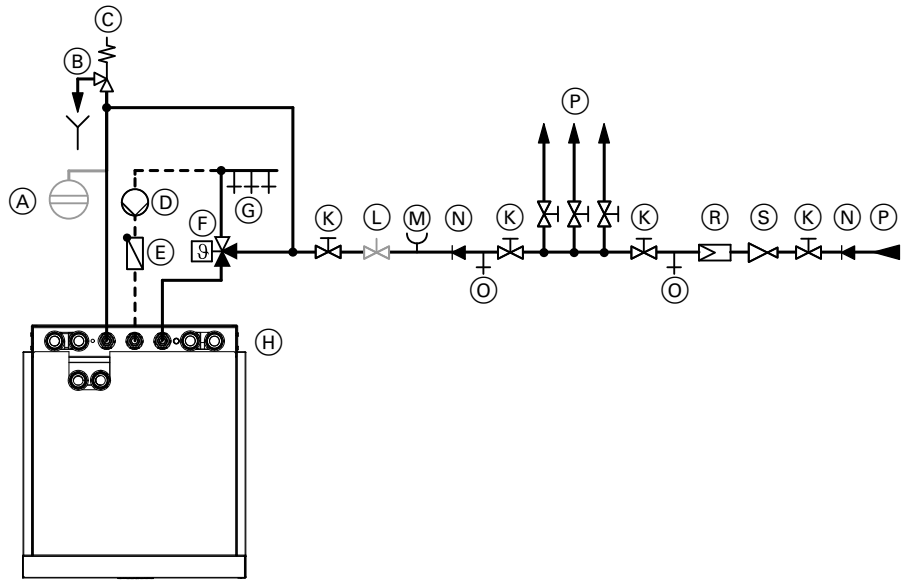
Vitocal 200-A



Example with Vitocell 100-V, type CVWA

Ⓐ DHW
Ⓑ Automatic thermostatic mixing valve
Ⓒ DHW circulation pipe
Ⓓ DHW circulation pump
Ⓔ Spring-loaded check valve
Ⓕ Expansion vessel, suitable for drinking water
Ⓖ Drain outlet
Ⓗ Visible discharge pipe outlet point (tundish)
Ⓚ Safety valve
Ⓛ Shut-off valve
Ⓜ Flow regulating valve (installation recommended)
Ⓝ Pressure gauge connection
Ⓞ Non-return valve
Ⓟ Cold water
Ⓡ Drinking water filter
Ⓢ Pressure reducer DIN 1988-200:2012-05
Ⓣ Non-return valve/pipe separator

Vitocal 222-A



Ⓐ Expansion vessel, suitable for drinking water
Ⓑ Visible discharge pipe outlet point (tundish)
Ⓒ Safety valve
Ⓓ DHW circulation pump
Ⓔ Spring-loaded check valve
Ⓕ Automatic thermostatic mixing valve
Ⓖ DHW
Ⓗ Heat pump terminal area (plan view)
Ⓚ Shut-off valve
Ⓛ Flow regulating valve
Ⓜ Pressure gauge connection
Ⓝ Non-return valve/pipe separator
Ⓞ Drain valve
Ⓟ Cold water
Ⓡ Drinking water filter
Ⓢ Pressure reducer DIN 1988-200:2012-05

Safety valve

The DHW cylinder **must** have a safety valve to protect against unduly high pressure.
Recommendation: Install safety valve above top edge of cylinder. This means the DHW cylinder will not need to be drained when working on the safety valve.

CH: According to W3 "Principles for creating potable water installations", safety valves must be drained directly via a visible unrestricted drain or via a short outlet line to the drain network.

Automatic thermostatic mixing valve

With appliances that heat DHW to temperatures above 60 °C, an automatic thermostatic mixing valve must be installed in the DHW line as protection against scalding.

This also particularly applies when connecting solar thermal systems.

7.12 DHW cylinder selection

When selecting the DHW cylinder ensure that its indirect coil surface area is large enough for the purpose.
Approximate calculation of the coil surface area:
Minimum indirect coil surface area in m^2 ≈ heat pump output in kW x 0.3 m^2/kW

Max. cylinder storage temperature
- Vitocal 200-A: 50 °C

Note
- *The stated cylinder storage temperature can only be achieved in the temperature range within the application limits to EN 14511 in which the heat pump reaches the max. flow temperature.*
- *The cylinder sizes listed in the following table are **standard values**. They are based on the following DHW demand: 50 l per person per day at a DHW temperature of 45 °C*

Vitocal 200-A

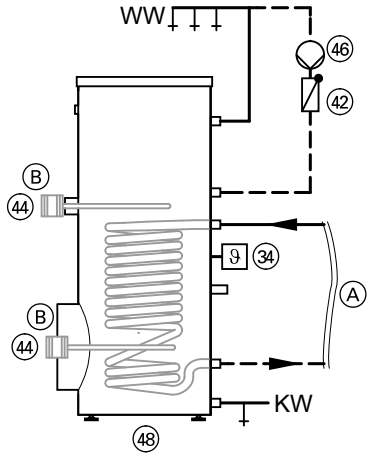
Heat pump operating mode	3 to 5 occupants DHW cylinder	Capacity	6 to 8 occupants DHW cylinder	Capacity
Mono mode	Vitocell 100-V/100-W, type CVAA	300 l	Vitocell 100-V, type CVA	500 l
	Vitocell 100-V, type CVWA	300 l 390 l	Vitocell 100-V, type CVWA	500 l
			Vitocell 100-L, type CVL + cylinder loading system	500 l
Dual mode	Vitocell 100-V/100-W, type CVBB	300 l	Vitocell 100-V/100-W, type CVBB	500 l

To ensure the DVGW Directive is fulfilled, an instantaneous heating water heater or second heat generator should be installed, so that DHW temperatures reach > 60 °C. Equipping the heat pump with an instantaneous heating water heater fulfils this requirement.

DHW cylinder specification
See technical guides for DHW cylinders.

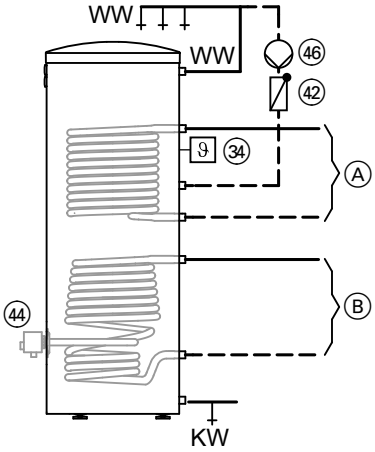
System examples

DHW cylinder with internal indirect coils



Hydraulic scheme when using Vitocell 100-V, type CVWA

Ⓐ Heat pump connection
Ⓑ Immersion heater EHE can be installed in top or bottom section
KW Cold water
DHW DHW



Hydraulic scheme when using Vitocell 100-B, type CVBB or Vitocell 100-W, type CVBB, 300 l (as dual mode system) or Vitocell 100-V, type CVAA, 300 l

Ⓐ External heat generator connection
Ⓑ Heat pump connection
KW Cold water
DHW DHW

Equipment required

Pos.	Designation	Quantity	Part no.
㉞	Cylinder temperature sensor	1	7438702
㊷	Spring-loaded check valve	1	On site
㊹	Immersion heater EHE	1	See Viessmann pricelist.
㊻	DHW circulation pump	1	See Vitoset pricelist.
㊽	DHW cylinder	1	See Viessmann pricelist.

7.13 Hydraulic connection of the cylinder loading system (for heat pump cascade with Vitocal 200-A)

Cylinder with external heat exchanger (cylinder loading system) and heating lance

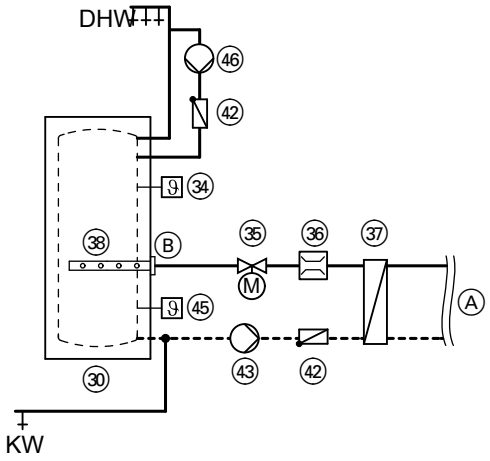
During the loading process (no draw-off), cold water from the cylinder is extracted from the lower section by means of the cylinder loading pump. The water is heated in the heat exchanger and resupplied to the cylinder via the heating lance mounted in the flange.

The generously sized outlet apertures in the heating lance result in low flow velocities, which in turn provide clear temperature stratification inside the cylinder.
DHW booster heating is possible if an additional immersion heater is installed (on site).

Design information (cont.)

Note

The flow rate in the DHW cylinder may be no more than 7 m^3/h.

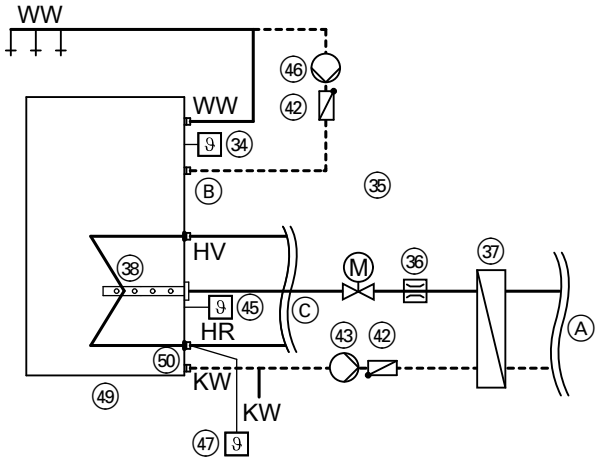


KW Cold water
WW DHW
Ⓐ Heat pump interface
Ⓑ DHW inlet from the heat exchanger

Equipment required

Pos.	Designation	Quantity	Part no.
㉚	Vitocell 100-L (500, 750 or 1000 l capacity) or Vitocell 100-V, type CVAA (300 l) or type CVA (500 l)	1	See Viessmann pricelist.
㉞	Top cylinder temperature sensor	1	7438702
㉟	2-way motorised ball valve (N/C)	1	7180573
㊱	Flow limiter (TacoSetter)	1	On site
㊲	Vitotrans 100 plate heat exchanger	1	See Viessmann pricelist.
㊳	Heating lance	1	ZK00037
㊷	Spring-loaded check valve	1	On site
㊸	Cylinder loading pump	1	7820403 or 7820404
㊺	Cylinder temperature sensor, bottom (optional)	1	7438702

DHW cylinder with external heat exchanger and solar backup



Ⓐ Heat pump connection
Ⓑ Use the DHW circulation connection.
Ⓒ Solar circuit connection
HR Solar circuit flow
HV Solar circuit return
KW Cold water
WW DHW

7

5831388

Equipment required

Pos.	Designation	Quantity	Part no.
㉞	Top cylinder temperature sensor	1	7438702
㉟	2-way motorised ball valve (N/C)	1	7180573
㊱	Flow limiter (TacoSetter)	1	On site
㊲	Vitotrans 100 plate heat exchanger	1	See Viessmann pricelist.
㊳	Heating lance	1	ZK00038
㊷	Spring-loaded check valve	2	On site
㊸	Cylinder loading pump	1	7820403 or 7820404
㊺	Bottom cylinder temperature sensor	1	7438702
㊻	DHW circulation pump	1	See Vitoset pricelist.
㊼	Cylinder temperature sensor (standard delivery with solar control module, type SM1 or Solar-Divicon, type PS 10)	1	7429073
㊾	Vitocell 100-V, type CVAA (300 l) or type CVA (500 l)	1	See Viessmann pricelist.
㊿	Threaded elbow as retainer for the cylinder temperature sensor 300/500 l (pos. ㊺)	1	7175213/7175214

DHW cylinder selection

Vitocal 200-A, type	Number of outdoor units	Vitocell 100-V, type CVWA (390 l)	Vitocell 100-L, type CVL (500 l)	Vitocell 100-L, type CVL (750 l)	Vitocell 100-L, type CVL (1000 l)
AWO-M 201.A04	2	X	X	X	X
AWO-M-E 201.A04	3	X	X	X	X
AWO-M-E-AC 201.A04	4	X	X	X	X
	5	X	X	X	X
AWO-M 201.A06	2	X			
AWO-M-E 201.A06	3		X	X	X
AWO-M-E-AC 201.A06	4		X	X	X
	5		X	X	X
AWO-M 201.A08	2	X			
AWO-M-E 201.A08	3		X	X	X
AWO-M-E-AC 201.A08	4		X	X	X
	5		X	X	X
AWO(-M) 201.A10	2	X	X	X	X
AWO(-M)-E 201.A10	3		X	X	X
AWO(-M)-E-AC 201.A10	4		X	X	X
	5		X	X	X
AWO(-M) 201.A13	2	X	X	X	X
AWO(-M)-E 201.A13	3		X	X	X
AWO(-M)-E-AC 201.A13	4		X	X	X
	5		X	X	X
AWO(-M) 201.A16	2	X	X	X	X
AWO(-M)-E 201.A16	3		X	X	X
AWO(-M)-E-AC 201.A16	4		X	X	X
	5		X	X	X

Subject to the operating point, the full heating output of the heat pump cascade is not always available for DHW heating.

7.14 Cooling mode

Vitocal 200-A, type
- AWO-E-AC 201.A
- AWO-M-E-AC 201.A

Vitocal 222-A, type
- AWOT-E-AC 221.A
- AWOT-M-E-AC 221.A

For cooling, the heat pumps operate in reverse mode. This means that the heat pump cycle is reversed.

System configurations for central cooling
Depending on the system configuration, cooling is possible by means of one cooling circuit or several cooling circuits simultaneously.

System configuration	Cooling via 1 heating/cooling circuit	1 heating/cooling circuit or 1 separate cooling circuit	Max. 3 heating/cooling circuits simultaneously
Without buffer cylinder	—	X	—
With heating water buffer cylinder	—	X	—
With heating water/coolant buffer cylinder	—	—	X
Heat pump compact appliance with installation kit with mixer	X	—	—

Since a heating water buffer cylinder is not suitable for coolant, for central cooling this buffer cylinder needs to be bypassed by means of a hydraulic bypass circuit.
A heating water/coolant buffer cylinder can store both heating water and coolant. As a result, **all** connected heating/cooling circuits can also be supplied with coolant.

Note
*The minimum flow rate and minimum system volume must be ensured also during cooling mode. Systems **without** heating water/coolant buffer cylinders require an overflow valve in the heating/cooling circuit for this purpose.*

For detailed information on system examples with central cooling:
www.viessmann-schemes.com

Cooling circuits
Cooling is possible either by means of a heating/cooling circuit (e.g. underfloor heating circuit) or a separate cooling circuit, e.g. a fan convector. Suitable thermostatic valves must be used for cooling via an underfloor heating circuit. Ensure that the thermostatic valves can be opened via the AC signal or manually to enable cooling operation during the cooling period. Radiators, panel radiators and similar are not suitable for cooling mode.
To prevent the formation of condensate, all visible components e.g. pipes, pumps, etc. must be thermally insulated with vapour diffusion-proof material.

Note
For cooling mode in the following cases, a room temperature sensor must be installed and enabled:
- *Weather-compensated cooling mode with room influence or room temperature-dependent cooling mode via an underfloor heating circuit*
- *Cooling mode via a separate cooling circuit, e.g. fan convector*

Weather-compensated cooling mode
In weather-compensated cooling mode, the set flow temperature is calculated from the relevant set room temperature and the current outside temperature (long term average) according to the cooling curve. Its level and slope are adjustable.

Room temperature-dependent cooling mode
The set flow temperature is calculated from the differential of the set room temperature and the actual room temperature.

Cooling with an underfloor heating system
The underfloor heating system can be used for heating and for cooling buildings and rooms.
Surface temperature limits must be maintained to observe comfort criteria and to prevent condensation. Therefore, the surface temperature of an underfloor heating system in cooling mode must not fall below 20 °C.
To prevent the formation of condensate on the surface of underfloor heating systems, install a contact humidistat (accessories) into the underfloor heating system flow. This safely prevents the formation of condensate, even if weather conditions change quite rapidly (e.g. during a thunderstorm).
The underfloor heating system should be sized in accordance with a flow/return temperature pair of approx. 14/18 °C.
The following table can be used to estimate the possible cooling capacity of an underfloor heating system.

The following applies in general:
The minimum flow temperature for cooling with an underfloor heating system and the minimum surface temperature are subject to the prevailing climatic conditions in the room (air temperature and relative humidity). These conditions must therefore also be taken into consideration during the engineering stage.

Estimated cooling capacity of an underfloor heating system depending on the floor covering and pipe spacing (assumed flow temperature approx. 16 °C, return temperature approx. 20 °C)

Floor covering		Tiles			Carpet		
Spacing	**mm**	**75**	**150**	**300**	**75**	**150**	**300**
Cooling capacity with pipe diameter							
–10 mm	W/m²	40	31	20	27	23	17
–17 mm	W/m²	41	33	22	28	24	18
–25 mm	W/m²	43	36	25	29	26	20

Details accurate for
Room temperature 26 °C
Relative humidity 50 %
Dew point temperature 15 °C

7.15 Connecting a solar thermal system

In conjunction with a solar control unit, a solar thermal system can be controlled for DHW heating, central heating backup and swimming pool heating. The heat-up priority can be selected individually at the heat pump control unit.
The heat pump control unit enables certain values to be checked.

When there is a high level of insolation, all heat consumers can be heated to a higher set value, thereby raising the solar coverage. All solar temperatures and set values can be scanned and adjusted via the control unit.

To prevent thermal shocks inside the solar circuit, the operation of the solar thermal system will be interrupted at collector temperatures > 120 °C (collector protection).

Solar DHW heating
The solar circuit pump starts and the DHW cylinder is heated up if the temperature differential between the collector temperature sensor and the cylinder temperature sensor (in the solar circuit return) is greater than the start temperature differential set at the solar control unit.
The heat pump will be prevented from heating the cylinder if the temperature at the cylinder temperature sensor (in the DHW cylinder, top) exceeds the set value selected at the heat pump control unit.
The solar thermal system heats the cylinder to the set value selected at the solar control unit.

Note
- *Hydraulic connection: See* ***www.viessmann-schemes.com****.*
- *Aperture area that can be connected: See the "Vitosol" technical guide.*

Solar central heating backup
The solar circuit pump and the circulation pump for cylinder heating start if the temperature differential between the collector temperature sensor and the cylinder temperature sensor (solar) is greater than the start temperature differential selected at the heat pump control unit. The heating water buffer cylinder is heated.

Heating stops when the temperature differential between the collector temperature sensor and the cylinder temperature sensor (solar) is less than half the hysteresis (standard: 6 K) or if the actual temperature captured by the lower cylinder temperature sensor corresponds to the selected set temperature.
See also the "Vitosol" technical guide.

Solar swimming pool heating
See "Vitosol" technical guide.

Solar control unit
Solar control module, type SM1 (accessories): See page 145.

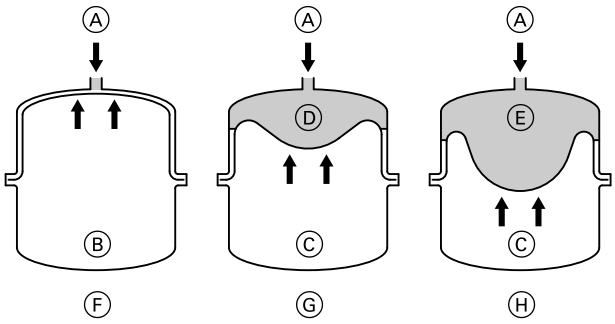
Note
The Solar-Divicon (part no. Z017690) also includes a solar control module: SDIO/SM1A electronics module

See Viessmann pricelist, register 13.

Sizing the solar expansion vessel

Solar expansion vessel

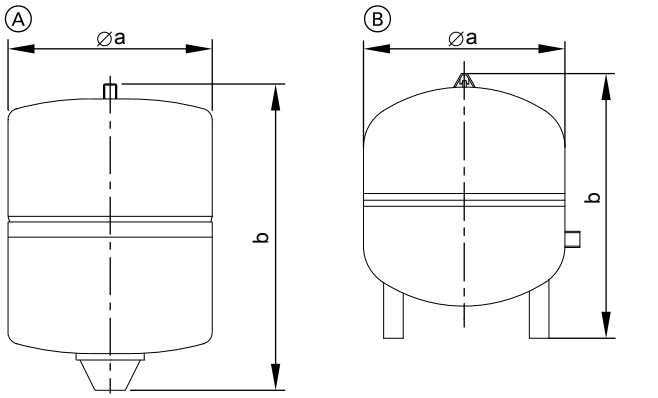
Design and function
With shut-off valve and fixings



Ⓐ Heat transfer medium
Ⓑ Nitrogen charge
Ⓒ Nitrogen buffer
Ⓓ Minimum safety seal 3 l
Ⓔ Safety seal
Ⓕ Delivered condition (pre-charge pressure 4.5 bar, 0.45 MPa)
Ⓖ Solar thermal system filled, without heat effect
Ⓗ At maximum pressure and the highest heat transfer medium temperature

A solar expansion vessel is a sealed vessel where the gas space (nitrogen charge) is separated from the space containing liquid (heat transfer medium) by a diaphragm and the pre-charge pressure is subject to the system height.

Specification



Expansion vessel	Part no.	Capacity l	Pre-charge pressure bar (MPa)	Ø a mm	b mm	Connection	Weight kg
Ⓐ	**7248241**	18	4.5 (0.45)	280	370	R ¾	7.5
	7248242	25	4.5 (0.45)	280	490	R ¾	9.1
	7248243	40	4.5 (0.45)	354	520	R ¾	9.9
Ⓑ	**7248244**	50	4.5 (0.45)	409	505	R 1	12.3
	7248245	80	4.5 (0.45)	480	566	R 1	18.4

Note
Included in standard delivery with solar packs

For details on the calculation of the required volume, see the "Vitosol" technical guide.

7.16 Tightness test on the refrigerant circuit

Heat pump refrigerant circuits containing a refrigerant with a CO_2 equivalent of 5 t or more must be tested regularly for tightness in accordance with EU Regulation No. 517/2014. In the case of hermetically sealed refrigerant circuits, this regular testing is required for a CO_2 equivalent of 10 t or more.
The intervals at which the refrigerant circuits will need to be tested depend on the level of CO_2 equivalent. If leak detection facilities are available on site, the test intervals are extended.

The Vitocal 200-A and Vitocal 222-A heat pumps have hermetically sealed refrigerant circuits. The CO_2 equivalent is below 10 t for all appliances.
A regular tightness test of the refrigerant circuit is therefore **not** required.

7.17 Intended use

The appliance is only intended to be installed and operated in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions.

Depending on the version, the appliance can only be used for the following purposes:
- Central heating
- Central cooling
- DHW heating

The range of functions can be extended with additional components and accessories.

Intended use presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

Commercial or industrial usage for a purpose other than central heating/cooling or DHW heating shall be deemed inappropriate.

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and will result in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended function.

Note
The appliance is intended exclusively for domestic or semi-domestic use, i.e. even users who have not had any instruction are able to operate the appliance safely.

Heat pump control unit

8.1 Vitotronic 200, type WO1C

Design and functions

Modular design
The control unit comprises the standard modules, PCBs and the programming unit.

Standard modules:
- ON/OFF switch
- Optolink interface
- Operating and fault display
- Fuses

PCBs for connecting external components:
- Connections for 230 V~ components, such as pumps, mixers etc.
- Connections for signal and safety components
- Connections for temperature sensors and KM BUS

Programming unit
- Straight forward operation:
  - Plain text display with graphic ability
  - Large font and black/white depiction for good contrast
  - Context-sensitive help texts
- With time switch
- Operating keys:
  - Navigation
  - Confirmation
  - Help
  - Extended menu
- Settings:
  - Standard and reduced room temperature
  - Standard and second DHW temperature
  - Operating program
  - Time programs, e.g. for central heating, DHW heating, DHW circulation and heating water buffer cylinder
  - Economy mode
  - Party mode
  - Holiday program
  - Heating and cooling curves
  - Parameter
- Display:
  - Flow temperatures
  - DHW temperature
  - Information
  - Operating data
  - Diagnostic details
  - Information, warning and fault messages

Heat pump control unit (cont.)

- Available languages:
  - German
  - Bulgarian
  - Czech
  - Danish
  - English
  - Spanish
  - Estonian
  - French
  - Croatian
  - Italian
  - Latvian
  - Lithuanian
  - Hungarian
  - Dutch
  - Polish
  - Russian
  - Romanian
  - Slovenian
  - Finnish
  - Swedish
  - Turkish

Functions

- Electronic maximum and minimum temperature limit
- Demand-dependent shutdown of the heat pump and the pumps for the primary and secondary circuits
- Adjustment of a variable heating and cooling limit
- Pump anti-seizing protection
- Monitoring frost protection of system components
- Integral diagnostic system
- Cylinder temperature controller with priority control
- Auxiliary function for DHW heating (short-term heating to a higher temperature)
- Control of a heating water buffer cylinder
- Screed drying program
- External hook-ups: Mixer OPEN, mixer CLOSE, changeover of operating mode (with external EA1 extension, accessories)
- External demand (adjustable set flow temperature) and heat pump blocking, specifying the set flow temperature via an external 0 to 10 V signal (with external EA1 extension, accessories)
- Function check of controlled components, e.g. circulation pumps
- Optimised utilisation of power generated by the photovoltaic system (on-site power consumption)
- Control and operation of compatible Viessmann ventilation units

Functions subject to heat pump type

Function	Vitocal 200-A, type		Vitocal 222-A, type	
	AWO(-M) 201.A AWO(-M)-E 201.A	AWO(-M)-E-AC 201.A	AWOT(-M)-E 221.A	AWOT(-M)-E-AC 221.A
Weather-compensated control of the flow temperatures for heating or cooling mode				
– System flow temperature or flow temperature for heating circuit without mixer A1/HC1	X	X	X	X
– Flow temperature for heating circuit with mixer M2/HC2: Direct control of the mixer motor by the control unit	X	X	X	X
– Flow temperature, heating circuit with mixer M3/HC3: Control of the mixer motor via the KM-BUS	X	X	X	X
– Flow temperature when cooling via a heating/cooling circuit or separate cooling circuit without buffer cylinder or in conjunction with a heating water buffer cylinder		X		X
– Flow temperature when cooling via max. 3 heating/cooling circuits in conjunction with a heating water/coolant buffer cylinder		X		X
Active cooling function (AC)		X		X
Solar DHW heating/central heating backup with graphic representation of solar yield Solar circuit pump **with** switching via PWM signal: – Control unit with solar control module, type SM1 (accessories) – Control unit with SDIO/SM1A electronics module (integrated in Solar-Divicon, type PS 10)	X	X	X*22	X*22
Instantaneous heating water heater switching	X	X	X	X
External heat generator switching (e.g. oil/gas boiler)	X	X		
Control of swimming pool heating – Control via EA1 extension	X	X	X	X
Heat pump cascade switching – For up to 5 Vitocal via LON (LON communication module required, accessory)	X	X		
Connection to higher KNX/EIB system via Vitogate 200, type KNX (LON communication module required, accessory)	X	X	X	X

**22 In conjunction with solar indirect coil set (accessory)*

Heat pump control unit (cont.)

Data communication overview

Device	Vitoconnect type OPTO2		Vitocom 100 type LAN1		Vitocom 300 type LAN3	
Operation	**ViCare app**	**Vitoguide**	**Vitotrol app**	**Vitodata 100**	**Vitodata 100**	**Vitodata 300**
Communication	WiFi Push notification	Email	Ethernet, IP networks Vitotrol app	Email, SMS, fax	Ethernet, IP networks Email, SMS, fax	
Max. number of heating systems	1	1	1	1	1	5
Max. number of heating circuits	3	3	3	32	32	32
Remote monitoring	X	X	X	X	X	X
Telecontrol	X	X	X	X	X	X
Remote setting (setting the heat pump control parameters)	–	–	–	–	–	X
Linking in the heat pump control unit	Optolink	Optolink	LON	LON	LON	LON
Accessories required for the heat pump control unit	–	–	Communication module (Vitocom standard delivery or accessories)			

Information on Vitoconnect
Heating system: Only 1 heat generator

Information on Vitodata 100
The full extent of the heat pump energy statement cannot be retrieved.

The requirements of EN 12831 for calculating the heat load are met.
To reduce the heat-up output, the "Reduced" operating status is switched to the "Standard" operating status if outside temperatures are low.
According to the [German] Energy Saving Ordinance, the temperature in each room must be individually controlled, e.g. by means of thermostatic valves.

Time switch

Digital time switch (integrated into the programming unit)
- Individual day and seven-day program
- Automatic summer/wintertime changeover
- Automatic function for DHW heating and DHW circulation pump
- Standard switching times are preset at the factory, e.g. for central heating, DHW heating, charging a heating water buffer cylinder and switching the DHW circulation pump.
- Time program is individually adjustable; up to 8 time phases per day
  Shortest switching interval: 10 min
  Power reserve: 14 days

Setting the operating programs

Frost protection monitoring for the system components is enabled in all operating programs (see frost protection function).
You can select the following operating programs via the menu:
- For heating/cooling circuits:
  "Heating and DHW" or "heating, cooling and DHW"
- For a separate cooling circuit:
  "Cooling"
- "Only DHW"; separate settings for each heating circuit

  Note
  If the heat pump only needs to be on for DHW heating (e.g. in the summer), the operating program "Only DHW" must be selected for ***all*** *heating circuits.*

- "Standby mode"
  Frost protection only

The operating programs can also be switched over externally, e.g. by Vitocom 100.

Frost protection function

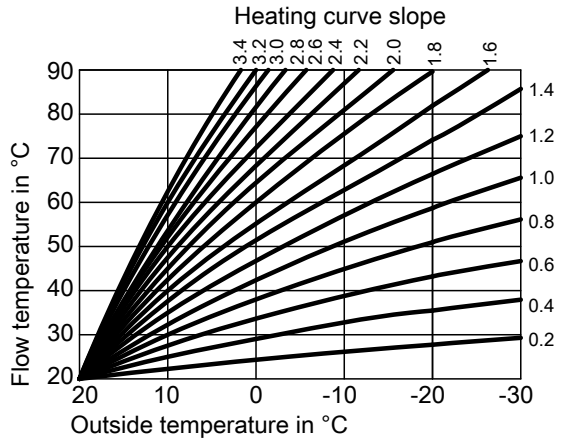
- If the outside temperature falls below +1 °C, the frost protection function is switched on.
  With active frost protection, the heating circuit pump will be switched on and the flow temperature in the secondary circuit will be maintained at a lower temperature of approx. 20 °C.
  The DHW cylinder will be heated to approx. 20 °C.
- If the outside temperature exceeds +3 °C, the frost protection function is switched off.

Heat pump control unit (cont.)

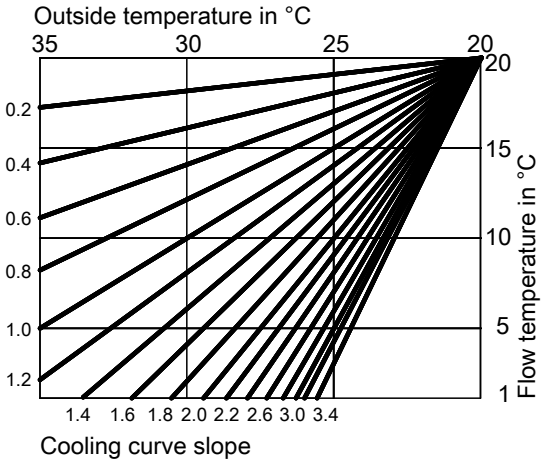
Heating and cooling curve settings (slope and level)

The Vitotronic 200 regulates the flow temperatures for the heating/cooling circuits in weather-compensated mode:
- System flow temperature or flow temperature for heating circuit without mixer A1/HC1
- Flow temperature for heating circuit with mixer M2/HC2: Control unit directly controls the mixer motor
- Flow temperature, heating circuit with mixer M3/HC3: Control of the mixer motor via the KM-BUS
- Flow temperature when cooling via heating/cooling circuit. The separate cooling circuit is controlled in room temperature-dependent mode.

The flow temperature required to reach a specific room temperature depends on the heating system and the thermal insulation of the building to be heated or cooled.
Adjusting the heating or cooling curves matches the flow temperature to these conditions.
- Heating curves:
  The flow temperature of the secondary circuit is restricted at the upper end of the scale by the temperature limiter and the maximum temperature set at the heat pump control unit.



- Cooling curves:
  The flow temperature of the secondary circuit is restricted at the lower end of the scale by the minimum temperature set at the heat pump control unit.



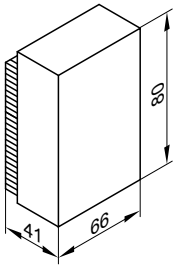
Heating systems with heating water buffer cylinder

When using hydraulic separation, a temperature sensor must be integrated in the heating water buffer cylinder. This temperature sensor is connected to the heat pump control unit.

Outside temperature sensor

Installation location:
- North or north-west facing wall of the building
- 2 to 2.5 m above the ground, for multi storey buildings in the upper half of the second floor

Connection:
- 2-core lead, length up to 35 m with a cross-section of 1.5 mm^2 (copper)
- Never route this lead immediately next to 230 V/400 V cables.



Specification

IP rating	IP 43 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature during operation, storage and transport	−40 to +70 °C

8.2 Specification, Vitotronic 200, type WO1C

General

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	6 A
Protection class	I
Permissible ambient temperature	
– Operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +65 °C
DHW temperature setting range	10 to +70 °C
Heating and cooling curves setting range	
– Slope	0 to 3.5
– Level	–15 to +40 K

Power supply for DHW circulation pump

*DHW circulation pumps with their own internal control units must be connected via a separate power supply. It is **not** permissible to use the power supply from the Vitotronic control unit or Vitotronic accessories.*

Supply values of 230 V~ components

Component		Connected load in W	Max. switching current in A	Vitocal 200-A, type AWO(-M) 201.A AWO(-M)-E 201.A	Vitocal 200-A, type AWO(-M)-E-AC 201.A	Vitocal 222-A, type AWOT(-M)-E 221.A	Vitocal 222-A, type AWOT(-M)-E-AC 221.A
	Secondary pump	130	4 (2)	X	X	X	X
	3-way diverter valve "Central heating/DHW heating" Additionally for cylinder loading system: Cylinder loading pump and 2-way shut-off valve	130	4 (2)	X	X	X	X
	Control of instantaneous heating water heater, stage 1	10	4 (2)	X	X	X	X
AC	Control of cooling (3-way diverter valve for bypass heating water buffer cylinder in cooling mode)	10	4 (2)		X		X
A1	Heating circuit pump for heating circuit without mixer A1/HC1	100	4 (2)	X	X	X	X
M2	Heating circuit pump for heating circuit with mixer M2/HC2	100	4 (2)	X	X	X	X
M2	Control of mixer motor, heating circuit M2/HC2, signal mixer CLOSE	10	0.2 (0.1)	X	X	X	X
M2	Control of mixer motor, heating circuit M2/HC2, signal mixer OPEN	10	0.2 (0.1)	X	X	X	X
	DHW circulation pump	50	4 (2)	X	X	X	X

5831388

Heat pump control unit (cont.)

Component		Connected load in W	Max. switching current in A	Vitocal 200-A, type AWO(-M) 201.A AWO(-M)-E 201.A	Vitocal 200-A, type AWO(-M)-E-AC 201.A	Vitocal 222-A, type AWOT(-M)-E 221.A	Vitocal 222-A, type AWOT(-M)-E-AC 221.A
	Control of mixer motor for external heat generator; signal mixer CLOSE	10	0.2 (0.1)	X	X		
	Mixer motor switching for external heat generator; signal mixer OPEN	10	0.2 (0.1)	X	X		
	External heat generator switching	Floating contact	4 (2)	X	X		
	Control of instantaneous heating water heater, stage 2	10	4 (2)	X	X	X	X
	Circulation pump for DHW reheating or	100	4 (2)	X	X		
	Immersion heater EHE switching						
	Total	Max. 1000	Max. 5(3) A				

Values in brackets at cos φ = 0.6

Note

- *Secondary pump, 3-way diverter valve for "central heating/DHW heating" and instantaneous heating water heater are integrated in the heat pump and connected at the factory.*
- *Heating circuit pump M3/HC3 and heating circuit mixer motor M3/HC3 are connected to the mixer extension kit (accessories).*

Control unit accessories

9.1 Overview

Accessories	Part no.	Vitocal 200-A, type AWO(-M) 201.A AWO(-M)-E 201.A	Vitocal 200-A, type AWO(-M)-E-AC 201.A	Vitocal 222-A, type AWOT(-M)-E 221.A	Vitocal 222-A, type AWOT(-M)-E-AC 221.A
Photovoltaics: See from page 136.					
Energy meter single phase	7506156	X	X	X	X
Energy meter 3-phase	7506157	X	X	X	X
Remote control units: See from page 137.					
Vitotrol 200-A	Z008341	X	X	X	X
Wireless remote control units: See from page 138.					
Vitotrol 200-RF	Z011219	X	X	X	X
Wireless accessories: See from page 139.					
Wireless base station	Z011413	X	X	X	X
Wireless repeater	7456538	X	X	X	X
Sensors: See from page 140.					
Contact temperature sensor (NTC 10 kΩ)	7426463	X	X	X	X
Immersion temperature sensor (NTC 10 kΩ)	7438702	X	X	X	X
Miscellaneous: See from page 140.					
Contactor relay	7814681	X	X	X	X
KM-BUS distributor	7415028	X	X	X	X
Swimming pool temperature controller: See from page 141.					
Temperature controller for regulating swimming pool temperature	7009432	X	X	X	X
Extension for heating circuit control unit, general: See from page 141.					
High limit safety cut-out 65 °C	7197797	X	X	X	X
Immersion thermostat	7151728	X	X	X	X
Contact thermostat	7151729	X	X	X	X

Control unit accessories (cont.)

Accessories	Part no.	Vitocal 200-A, type		Vitocal 222-A, type	
		AWO(-M) 201.A AWO(-M)-E 201.A	AWO(-M)-E-AC 201.A	AWOT(-M)-E 221.A	AWOT(-M)-E-AC 221.A
Extension for heating circuit control unit for heating circuit with mixer M2/HC2 or for integrating the external heat generator (direct switching via the Vitotronic): See from page 142.					
Mixer extension kit	7441998	X	X	X	X
Extension for heating circuit control unit for heating circuit with mixer M3/HC3 (controlled via the Vitotronic KM-BUS): See from page 143.					
Mixer extension kit (mounted on the mixer)	ZK02940	X	X	X	X
Mixer extension kit (wall mounting)	ZK02941	X	X	X	X
Solar DHW heating and central heating backup: See from page 145.					
Solar control module, type SM1	Z014470	X	X	X	X
Function extensions: See from page 146.					
AM1 extension	7452092	X	X	X	X
EA1 extension	7452091	X	X	X	X
Communication technology: See from page 146.					
Vitoconnect, type OPTO2	ZK04789	X	X	X	X
Vitocom 100, type LAN1 with communication module	Z011224	X	X	X	X
Vitocom 300, type LAN3	Z011399	X	X	X	X
LON communication module	7172173	X	X	X	X
LON communication module for cascade control	7172174	X	X		
LON cable for control unit data exchange	7134495	X	X	X	X
LON coupling, RJ 45	7143496	X	X	X	X
LON plug-in connector, RJ 45	7199251	X	X	X	X
LON socket, RJ 45	7171784	X	X	X	X
Terminator	7143497	X	X	X	X

Note

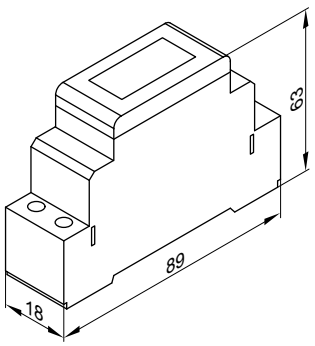
- *The following description of control unit accessories lists all functions and connections of each control unit accessory. Not all of these functions and connections are available for every heat pump.*
- *For further information on communication technology, see the "Data communication" technical guide.*

9.2 Photovoltaics

Electricity meter, single phase

Part no. 7506156

Connection:
- Installation on 35 mm top-hat rail (as per EN 60715 TH35)
- Power cable cross-section: max. 6 mm²
- Control circuit cross-section: max. 2.5 mm²



Specification

Single phase electricity meter	
Rated voltage	230 V~$^{-20 \text{ to } +15\ \%}$
Rated frequency	50 Hz$^{-20 \text{ to } +15\ \%}$
Current	
– Reference current	5 A
– Max. test current	32 A
– Starting current	20 mA
– Min. current	0.25 A
Power consumption	0.4 W actual power
Display	
– Actual power, voltage, current	LCD, 7-digit
– Count range	0 to 999999.9
– Pulses	2000 per kWh
– Accuracy categories	B as per EN 50470-3 1 as per IEC 62053-21
Permissible ambient temperature	
– Operation	−10 to +55 °C
– Storage and transport	−30 to +85 °C

Electricity meter, 3-phase

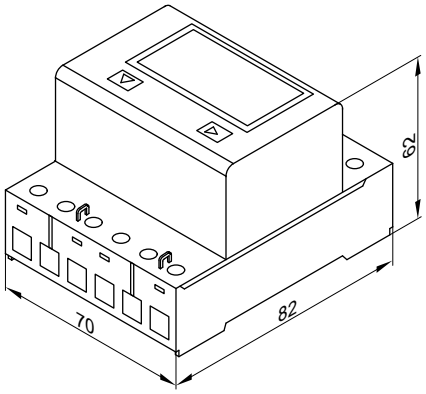
Part no. 7506157

With standard Modbus interface.

The Vitotronic control unit receives information via the Modbus detailing whether and how much (residual) energy is available to the heat pump from the photovoltaic system.

For optimised utilisation of the self-generated power from photovoltaic systems (own energy consumption), the following components and functions may be enabled by the Vitotronic control unit:
- Heat pump compressor.
- Heating of the DHW cylinder to the set DHW temperature or the second set DHW temperature.
- Heating the heating water buffer cylinder.
- Central heating
- Central cooling

Connection:
- Installation on top-hat rail 35 mm (to EN 60715 TH35)
- Main circuit cable cross-section: 1.5 to 16 mm²
- Control circuit cable cross-section: Max. 2.5 mm²



Specification

Rated voltage	3 x 230 V~/400 V~$^{-20 \text{ to } +15\ \%}$
Rated frequency	50 Hz$^{-20 \text{ to } +15\ \%}$
Electricity	
– Reference current	10 A
– Max. measurable current	65 A
– Starting current	40 mA
– Min. current	0.5 A
Power consumption	0.4 W actual power per phase
Display	
– Per phase: Actual power, voltage, current	LCD, 7-digit, for 1 or 2 tariffs
– Count range	0 to 999999.9
– Pulses	100 per kWh
– Accuracy categories	B as per EN 50470-3 1 as per IEC 62053-21
Permissible ambient temperature	
– Operation	−10 to +55 °C
– Storage and transport	−30 to +85 °C

9.3 Remote control units

Information on Vitotrol 200-A

A Vitotrol 200-A can be used for each heating or cooling circuit.
The Vitotrol 200-A can operate 1 heating/cooling circuit.
Up to 3 remote control units can be connected to the control unit.

Note
Hardwired remote control units cannot be combined with the wireless base station.

Vitotrol 200-A

Part no. Z008341
KM-BUS subscriber
- Displays:
  – Room temperature
  – Outside temperature
  – Operating condition
- Party and economy mode can be enabled via keys
- Integral room temperature sensor for room temperature hook-up (only for one heating circuit with mixer)
- Settings:
  – Set room temperature for standard mode (normal room temperature)

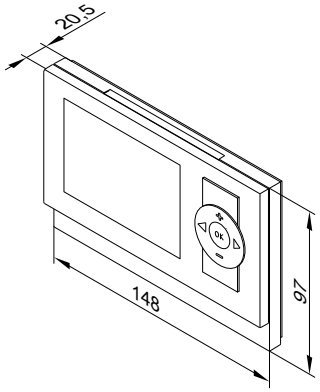
  Note
  The set room temperature for reduced mode (reduced room temperature) is set at the control unit.

  – Operating program

Installation location:
- Weather-compensated mode:
  Installation anywhere in the building
- Room temperature hook-up:
  The integral room temperature sensor captures the actual room temperature and effects any necessary correction of the flow temperature.

  The captured room temperature depends on the installation site:
  – Main living room on an internal wall opposite radiators
  – Not on shelves or in recesses
  – Never in the immediate vicinity of doors or close to heat sources (e.g. direct insolation, fireplace, TV set, etc.).

Connection:
- 2-core lead, length max. 50 m (even if connecting several remote control units)
- Never route this lead immediately next to 230/400 V cables
- LV plug as standard delivery



Specification

Power supply	Via KM-BUS
Power consumption	0.2 W
Protection class	III
IP rating	IP 30 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	−20 to +65 °C
Setting range of the set room temperature for standard mode	3 to 37 °C

Notes
- *If the Vitotrol 200-A is to be used for room temperature hook-up, site the device in a main living room (lead room).*
- *Connect maximum 3 Vitotrol 200-A units to the control unit.*

9.4 Wireless remote control units

Information on Vitotrol 200-RF

Wireless remote control unit with integral wireless transmitter for operation with the wireless base station.
A Vitotrol 200-RF can be used for each heating or cooling circuit.
The Vitotrol 200-RF can operate one heating/cooling circuit.
Up to 3 wireless remote control units can be connected to the control unit.

Note
*The wireless remote control unit **cannot** be combined with a hard-wired remote control.*

Vitotrol 200-RF

Part no. Z011219
Wireless subscriber
- Displays:
  - Room temperature
  - Outside temperature
  - Operating condition
  - Wireless signal reception quality
- Settings:
  - Set room temperature for standard mode (normal room temperature)

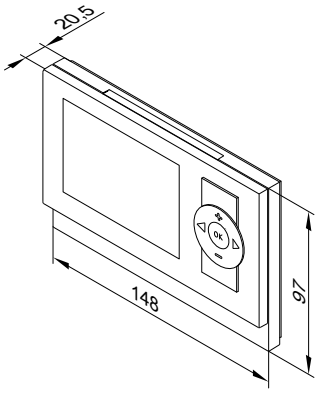
    Note
    The set room temperature for reduced mode (reduced room temperature) is set at the control unit.

  - Operating program
- Party and economy mode can be enabled via keys
- Integral room temperature sensor for room temperature hook-up (only for one heating circuit with mixer)

Installation location:
- Weather-compensated mode:
  Installation anywhere in the building
- Room temperature hook-up:
  The integral room temperature sensor captures the room temperature and effects any necessary correction of the flow temperature.

  The captured room temperature depends on the installation site:
  - Main living room on an internal wall opposite radiators
  - Not on shelves or in recesses
  - Never in the immediate vicinity of doors or close to heat sources (e.g. direct insolation, fireplace, TV set, etc.)

Note
Observe the "Wireless accessories" technical guide.



Specification

Power supply	2 AA batteries 3 V
Radio frequency	868 MHz
Wireless range	See "Wireless accessories" technical guide
Protection class	III
IP rating	IP 30 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	−20 to +65°C
Setting range of the set room temperature for standard mode	3 to 37 °C

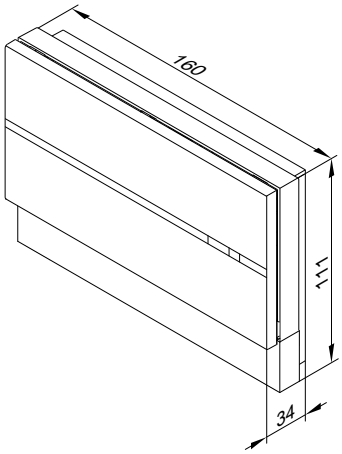
9.5 Wireless accessories

Wireless base station

Part no. Z011413

KM-BUS subscribers
- For communication between the Vitotronic control unit and Vitotrol 200-RF wireless remote control
- For up to 3 wireless remote control units. Not in conjunction with a hardwired remote control unit

Connection:
- 2-core lead: Length up to 50 m (even when connecting several KM-BUS subscribers)
- Never route this lead immediately next to 230 V/400 V cables.



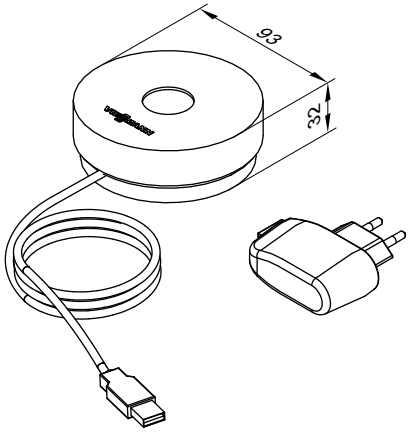
Specification

Power supply via KM-BUS	
Power consumption	1 W
Radio frequency	868 MHz
Protection class	III
IP rating	IP 20 to EN 60529, ensure through design/installation.
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C

Wireless repeater

Part no. 7456538

Mains operated wireless repeater to increase the wireless range and for use in areas where wireless communication is difficult. Observe the "Wireless accessories" technical guide.
Do not use more than one wireless repeater per Vitotronic control unit.
- For preventing strongly diagonal angles of penetration of the radio signals through steel reinforced concrete ceilings/floors and/or multiple walls
- For circumventing large metallic objects situated between the wireless components.



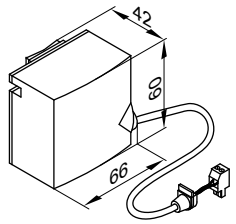
Specification

Power supply	230 V~/5 V⎓ via plug-in power supply unit
Power consumption	0.25 W
Radio frequency	868 MHz
Lead length	1.1 m with plug
Safety category	II
IP rating	IP 20 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +55 °C
– Storage and transport	−20 to +75 °C

9.6 Sensors

Contact temperature sensor

Part no. 7426463
As system flow temperature sensor in heating systems with heating water buffer cylinder and/or external heat generator



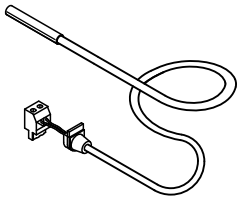
Secured with a tie.

Specification

Lead length	5.8 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

Immersion temperature sensor

Part no. 7438702
- To capture the temperature in a sensor well
- For installation in a DHW cylinder or heating water buffer cylinder



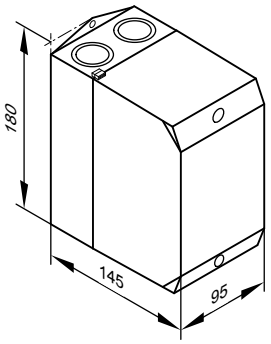
Specification

Lead length	5.8 m, fully wired
IP rating	IP 32 to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	–20 to +70 °C

9.7 Miscellaneous

Contactor relay

Part no. 7814681
- Contactor in small enclosure
- With 4 N/C and 4 N/O contacts
- With terminal strips for earth conductors

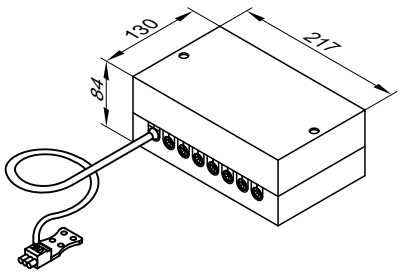


Specification

Coil voltage	230 V/50 Hz
Rated current (I_{th})	AC1 16 A AC3 9 A

KM BUS distributor

Part no. 7415028
For the connection of 2 to 9 devices to the control unit KM-BUS



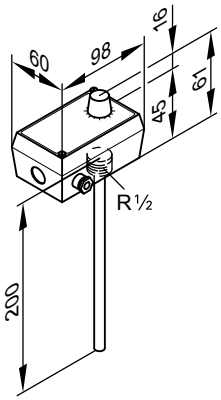
Specification

Lead length	3.0 m, fully wired
IP rating	IP 32 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	−20 to +65 °C

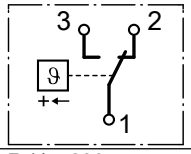
9.8 Swimming pool temperature control

Temperature controller for regulating the swimming pool temperature

Part no. 7009432



Specification

Connection	3-core lead with a cross-section of 1.5 mm²
Setting range	0 to 35 °C
Switching differential	0.3 K
Breaking capacity	10(2) A, 250 V~
Switching function	with rising temperature from 2 to 3 
Stainless steel sensor well	R ½ x 200 mm

9.9 Extension for heating circuit control unit, general

High limit safety cut-out

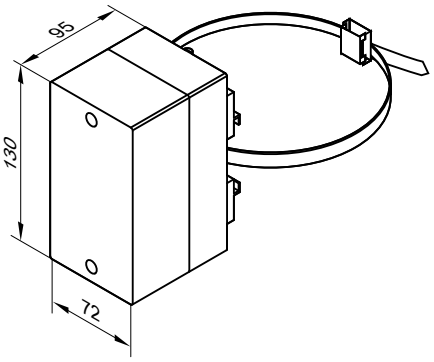
Part no. 7197797

Note
Only use with heat pumps that reach a flow temperature of up to 65 °C.

If an external heat generator is connected in the secondary circuit, the high limit safety cut-out protects the heat pump refrigerant circuit from unacceptably high temperatures.

Examples of heat generators:
- Solar thermal systems
- Solid fuel boilers
- Non-modulating boilers

The high limit safety cut-out is connected to the control unit of the external heat generator. If the heat generator exceeds the temperature, it is switched off via the high limit safety cut-out.



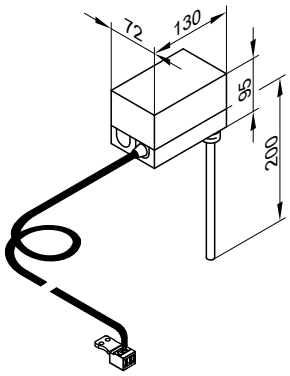
Specification, high limit safety cut-out

Connection	4.2 m, fully wired
Switching point	65 °C (cannot be changed)
Switching tolerance	+0/–6.5 K
IP rating	IP 41 to EN 60529; ensure through design/installation.
Ambient temperature	Max. 50 °C
Sensor temperature	Max. 90 °C
Sensor diameter	6.5 mm

9

Immersion thermostat

Part no. 7151728
May be used as a maximum temperature limiter for underfloor heating systems.
The temperature limiter is integrated into the heating flow. If the flow temperature is too high, the temperature limiter switches off the heating circuit pump.

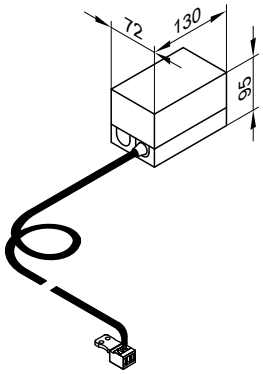


Specification

Cable length	4.2 m, fully wired
Setting range	30 to 80 °C
Switching differential	Max. 11 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	Inside the enclosure
Stainless steel sensor well (male thread)	R ½ x 200 mm
DIN reg. no.	DIN TR 1168

Contact thermostat

Part no. 7151729
May be used as a maximum temperature limiter for underfloor heating systems (only in conjunction with metal pipes).
The temperature limiter is integrated into the heating flow. If the flow temperature is too high, the temperature limiter switches off the heating circuit pump.



Specification

Lead length	4.2 m, fully wired
Setting range	30 to 80 °C
Switching differential	Max. 14 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	Inside the casing
DIN reg. no.	DIN TR 1168

9.10 Extension for heating circuit control unit for heating circuit with mixer M2/HC2 or for integrating the external heat generator

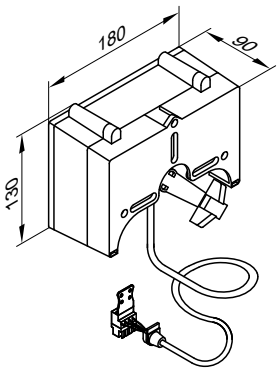
Note
The mixer is linked into the flow, downstream of the heating water buffer cylinder (if installed) and controlled by the heat pump control unit.

Mixer extension kit

Part no. 7441998

Components:
- Mixer motor with connecting cable (4.0 m long) for Viessmann mixer DN 20 to DN 50 and R ½ to R 1¼ (not for flanged mixers) and plug
- Flow temperature sensor as contact temperature sensor with connecting cable (5.8 m long) and plug
- Plug for heating circuit pump

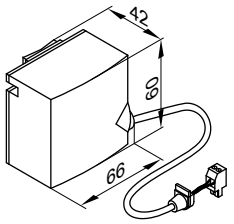
Mixer motor



Mixer motor specification

Rated voltage	230 V~
Rated frequency	50 Hz
Power consumption	4 W
Safety category	II
IP rating	IP 42 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	−20 to +65 °C
Torque	3 Nm
Runtime for 90° ∢	120 s

Flow temperature sensor (contact temperature sensor)



Secured with a tie.

Specification, flow temperature sensor

IP rating	IP 32D to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

9.11 Extension for heating circuit control unit for heating circuit with mixer M3/HC3 (switched via the Vitotronic KM-BUS)

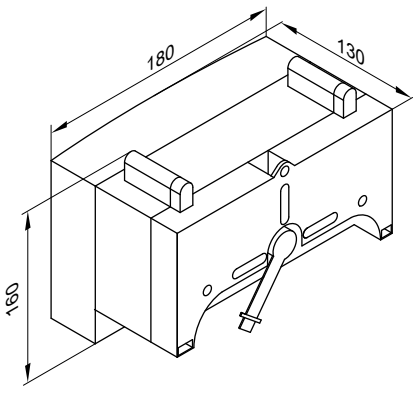
Mixer extension kit with integral mixer motor

Part no. ZK02940
KM-BUS subscribers

Components:
- Mixer PCB with mixer motor for Viessmann mixer DN 20 to DN 50 and R ½ to R 1¼
- Flow temperature sensor (contact temperature sensor)
- Plug for connecting the heating circuit pump
- Power cable (3.0 m long) with plug
- Bus connecting cable (3.0 m long) with plug

The mixer motor is mounted directly onto the Viessmann mixer DN 20 to DN 50 and R ½ to R 1¼.

Mixer PCB with mixer motor

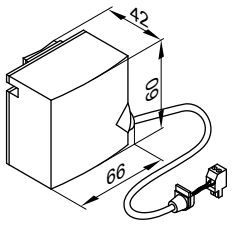


Control unit accessories (cont.)

Specification, mixer PCB with mixer motor

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	5.5 W
IP rating	IP 32D to EN 60529; ensure through design/installation
Protection class	I
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C
Rated breaking capacity of the relay output for heating circuit pump [20]	2(1) A, 230 V~
Torque	3 Nm
Runtime for 90° ◁	120 s

Flow temperature sensor (contact temperature sensor)



Secured with a tie.

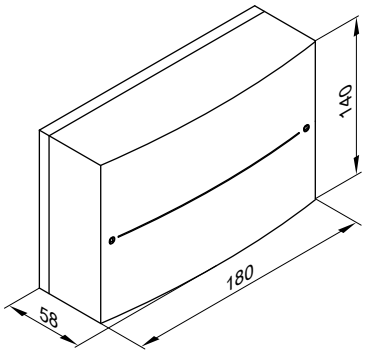
Specification, flow temperature sensor

Cable length	2.0 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

Mixer extension kit for separate mixer motor

Part no. ZK02941
KM-BUS subscribers
For connecting a separate mixer motor
Components:
- Mixer PCB for connecting a separate mixer motor
- Flow temperature sensor (contact temperature sensor)
- Plug for connecting the heating circuit pump and the mixer motor
- Power cable (3.0 m long) with plug
- Bus connecting cable (3.0 m long) with plug

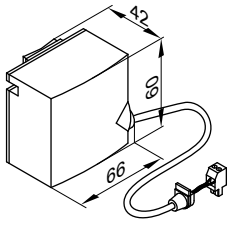
Mixer PCB



Specification mixer PCB

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
IP rating	IP 20D to EN 60529, ensure through design/installation
Protection class	I
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C
Rated relay output breaking capacity	
– Heating circuit pump [20]	2(1) A, 230 V~
– Mixer motor	0.1 A, 230 V~
Required runtime of the mixer motor for 90° ◁	Approx. 120 s

Flow temperature sensor (contact temperature sensor)



Secured with a tie.

Specification, flow temperature sensor

Cable length	5.8 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

9.12 Solar DHW heating and central heating backup

Solar control module, type SM1

Part no. Z014470
Function extension inside wall mounting enclosure
Electronic temperature differential control for dual mode DHW heating and central heating backup using solar collectors

Specification

Functions
- Output statement and diagnostic system
- Operation and display via the Vitotronic control unit.
- Switching the solar circuit pump
- Heating of 2 consumers via a collector array
- 2nd temperature differential control
- Thermostat function for reheating or utilising excess heat
- Speed control for solar circuit pump via PWM input (make: Grundfos and Wilo)
- Suppression of DHW cylinder reheating by the heat generator subject to solar yield
- Heat-up of the solar preheating stage (with 400 l DHW cylinders or larger)
- Collector safety shutdown
- Electronic temperature limitation in the DHW cylinder
- Switching of an additional pump or valve via relay

To implement the following functions, also order immersion temperature sensor, part no. 7438702:
- For DHW circulation diversion in systems with 2 DHW cylinders
- For return changeover between the heat generator and the heating water buffer cylinder
- For return changeover between the heat generator and the primary heat store
- For heating additional consumers

Structure

The solar control module contains:
- PCB
- Terminals:
  - 4 sensors
  - Solar circuit pump
  - KM BUS
  - Power supply (on-site ON/OFF switch)
- PWM output for switching the solar circuit pump
- 1 relay for switching one pump or one valve

Collector temperature sensor
For connection inside the appliance

On-site extension of the connecting lead:
- 2-core lead, length up to 60 m with a cross-section of 1.5 mm^2 (copper)
- Never route this lead immediately next to 230/400 V cables.

Collector temperature sensor specification

Lead length	2.5 m
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 20 kΩ at 25 °C
Permissible ambient temperature	
– Operation	−20 to +200 °C
– Storage and transport	−20 to +70 °C

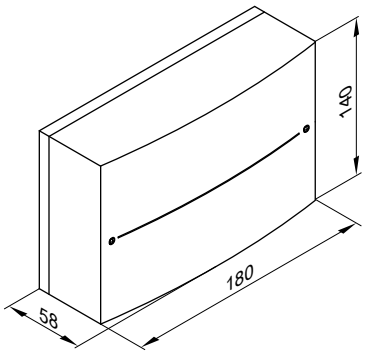
Cylinder temperature sensor
For connection inside the appliance

On-site extension of the connecting lead:
- 2-core lead, length up to 60 m with a cross-section of 1.5 mm^2 (copper)
- Never route this cable immediately next to 230/400 V cables.

Cylinder temperature sensor specification

Lead length	3.75 m
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	−20 to +70 °C

For systems with Viessmann DHW cylinders, the cylinder temperature sensor is installed in the threaded elbow in the heating water return (standard delivery or accessory for the relevant DHW cylinder).



Solar control module specification

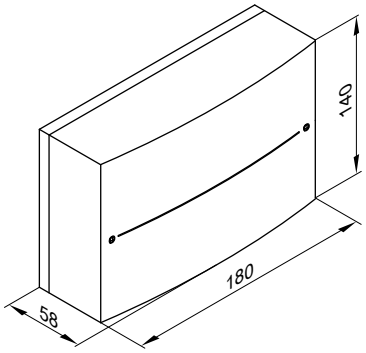
Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
Protection class	I
IP rating	IP 20 to EN 60529; ensure through design/installation.
Function type	Type 1B to EN 60730-1
Permissible ambient temperature	
– Operation	0 to +40 °C, use in the living space or boiler room (standard ambient conditions)
– Storage and transport	−20 to +65 °C
Rated relay output breaking capacity	
– Semi-conductor relay 1	1 (1) A, 230 V~
– Relay 2	1 (1) A, 230 V~
– Total	Max. 2 A

9.13 Function extensions

AM1 extension

Part no. 7452092
Function extension inside wall mounting enclosure

Using the extension enables the following functions to be achieved:
- Cooling via coolant buffer cylinder
  or
- Central fault message
- Heat transfer to the coolant buffer cylinder



Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	4 A
Power consumption	4 W
Rated relay output breaking capacity	2(1) A, 250 V~ each, total max. 4 A~
Safety category	I
IP rating	IP 20 D to EN 60529, ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +65 °C

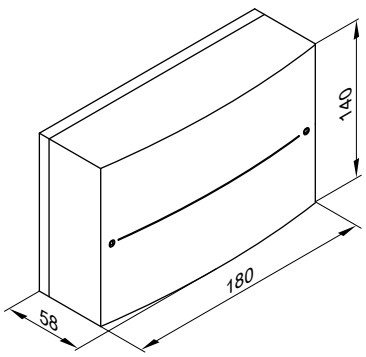
EA1 extension

Part no. 7452091
Function extension inside a casing, for wall mounting.
Using the inputs and outputs allows up to 5 functions to be implemented.

1 analogue input (0 to 10 V):
- Default set flow temperature, secondary circuit.

3 digital inputs:
- External changeover of the operating state.
- External demand and blocking.
- External demand for a minimum heating water temperature.

1 switching output:
- Swimming pool heating control.



Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	4 W
Rated breaking capacity of the relay output	2(1) A, 250 V~
Safety category	I
IP rating	IP 20 D to EN 60529, ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +65 °C

9.14 Communication technology

Note
For further information on communication technology, see the "Data communication" technical guide.

Vitoconnect, type OPTO2

Part no. ZK04789

- Internet interface for remote control of a heating system with 1 heat generator via WiFi with DSL router
- Compact device for wall mounting
- For system operation with **ViCare app** and/or **Vitoguide**

Functions when operating with the ViCare app
- Calling up the temperatures of connected heating circuits
- Intuitive adjustment of preferred temperatures and time programs for central heating and DHW heating
- Easy transmission of system data, e.g. fault messages via email or telephone communication with the heating contractor
- Heating system fault reporting by push notification

The ViCare app supports mobile devices with the following operating systems:
- Apple iOS
- Google Android

Note
- *Compatible versions: Visit the App Store or Google Play.*
- *Further information: Visit **www.vicare.info***

Functions when operating with Vitoguide
- Monitoring of heating system following service clearance by the system user
- Access to operating programs, set values and time programs
- Retrieving system information for all connected heating systems
- Display and forwarding of fault messages in plain text

Vitoguide supports the following end devices:
- Mobile devices with a screen size of 8 inches or larger

Note
*Further information: Visit **www.vitoguide.info***

On-site requirements
- Compatible heating systems with Vitoconnect, type OPTO2

Note
*Supported control units: Visit **www.viessmann.de/vitoconnect***

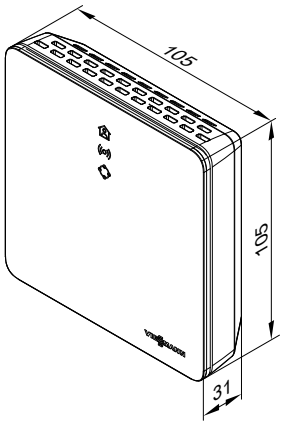
- Before commissioning, check the system requirements for communication via local IP networks/WiFi.
- Port 443 (HTTPS) and port 123 (NTP) must be open.
- The MAC address is printed on the device label.
- Internet connection with flat rate data (**without time or volume restrictions**)

Installation location
- Installation type: Wall mounting
- Installation only in enclosed buildings
- The installation location must be dry and free of frost.
- Distance to heat generator min. 0.3 m and max. 2.5 m
- Standard socket 230 V/50 Hz
  or
  US/CA: Socket 120 V/60 Hz
  max. 1.5 m to installation location
- Internet access with adequate WiFi signal

Note
The WiFi signal strength can be increased with commercially available WiFi repeaters.

Standard delivery
- Web interface for wall mounting
- Power cable with plug-in power supply unit (1.5 m long)
- Connecting cable with Optolink/USB (WiFi module/boiler control unit, 3 m long)

Specification



Vitoconnect specification

Rated voltage	12 V⎓
WiFi frequency	2.4 GHz
WiFi encryption	Unencrypted or WPA2
Frequency band	2400.0 to 2483.5 MHz
Max. transmitting power	0.1 W (e.i.r.p.)
Internet protocol	IPv4
IP assignment	DHCP
Rated current	0.5 A
Power consumption	5.5 W
Protection class	III
IP rating	IP 20D to EN 60529
Permissible ambient temperature	
– Operation	5 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +60 °C

Plug-in power supply unit specification

Rated voltage	100 to 240 V~
Rated frequency	50/60 Hz
Output voltage	12 V⎓
Output current	1 A
Protection class	II
Permissible ambient temperature	
– Operation	5 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +60 °C

Keyword index

5831388

Keyword index

5831388

Keyword index

5831388

Keyword index

Subject to technical modifications.

Viessmann Werke GmbH & Co. KG
D-35107 Allendorf
Telephone: +49 6452 70-0
Fax: +49 6452 70-2780
www.viessmann.com

Viessmann Limited
Hortonwood 30, Telford
Shropshire, TF1 7YP, GB
Telephone: +44 1952 675000
Fax: +44 1952 675040
E-mail: info-uk@viessmann.com

5831388