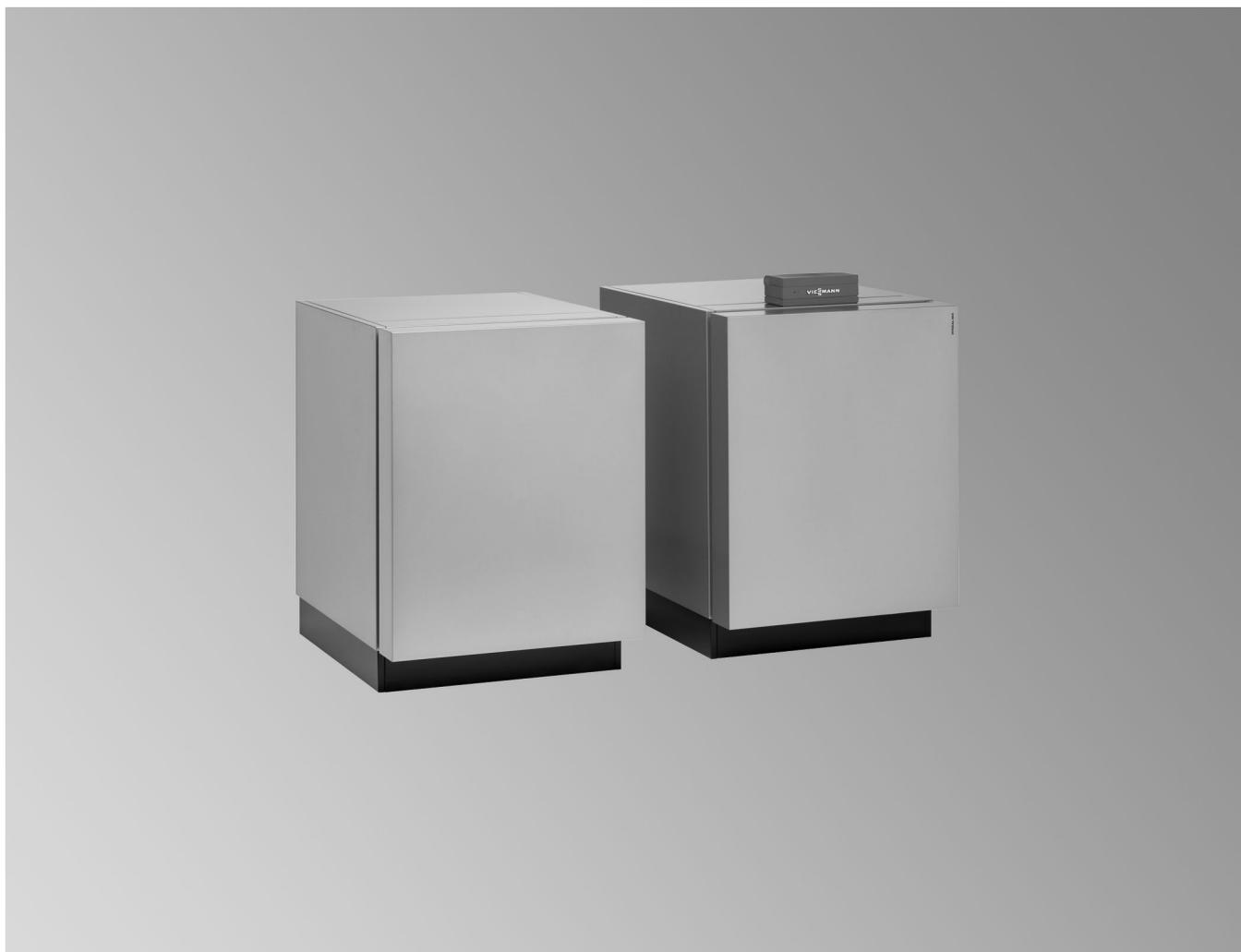


Datasheet

For part no. and prices: see pricelist



Heat pumps with electric drive for central heating and DHW heating in mono mode or dual mode heating systems

VITOCAL 300-G

Up to 60 °C flow temperature

- **Type BW 301.A21 to A45**

Single stage heat pump without integral circulation pumps, also as stage 1 (master) of a two-stage heat pump

- **Type BWS 301.A21 to A45**

Stage 2 (slave) of a two-stage heat pump, without individual control unit

VITOCAL 350-G

Up to 70 °C flow temperature

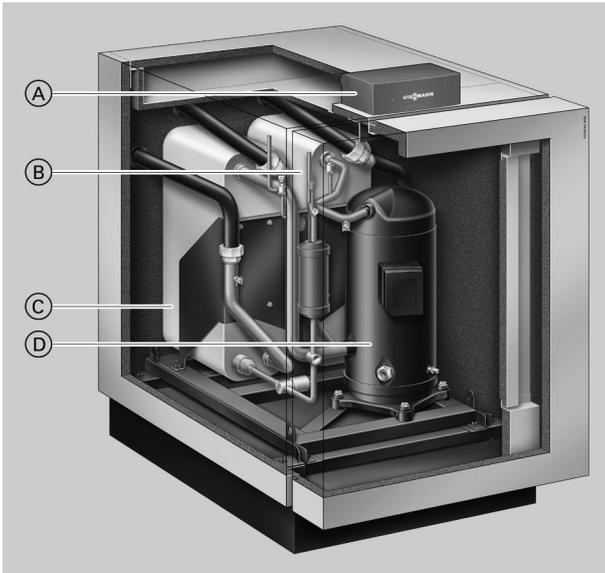
- **Type BW 351.B20 to B42**

Single stage heat pump without integral circulation pumps, also as stage 1 (master) of a two-stage heat pump

- **Type BWS 351.B20 to B42**

Stage 2 (slave) of a two-stage heat pump, without individual control unit

Vitocal 300-G benefits



- (A) Vitotronic 200 weather-compensated, digital heat pump control unit
- (B) Condenser
- (C) Evaporator
- (D) Hermetically sealed Compliant scroll compressor

- Low running costs thanks to high COP (coefficient of performance) to EN 14511: Up to 4.8 (B0/W35)
- Mono mode operation for central heating and DHW heating
- Maximum flow temperatures of up to 60 °C for high DHW convenience
- Low noise and vibration levels thanks to sound-optimised appliance design – sound power level < 48 dB(A)
- Low running costs with the highest level of efficiency at any operating point through the innovative Refrigerant Cycle Diagnostic (RCD) system with electronic expansion valve (EEV)
- With the 2-stage version (type BW+BWS):
Highly flexible due to option of combining modules of different outputs
Easier handling through smaller and lighter modules

Only type BW:

- Easy to use Vitotronic control unit with plain text and graphic display for weather-compensated heating operation, with natural cooling and active cooling functions
- Higher output can be achieved through cascade arrangement: 21.2 to 428.0 kW
- Optimised utilisation of power generated by an on-site photovoltaic system
- Web-enabled through Vitoconnect (accessories) for operation and service via Viessmann apps

Delivered condition, type BW

- Complete compact heat pump as a 1-stage heat pump or as stage 1 (master) of a 2-stage heat pump
- Adjustable anti-vibration feet

- Weather-compensated Vitotronic 200 heat pump control unit with outside temperature sensor
- Electronic starting current limiter and integral phase monitor

Delivered condition, type BWS

- Compact heat pump as stage 2 (slave)
- Adjustable anti-vibration feet

- Electrical connecting cable for connection to stage 1 (master).
- Electronic starting current limiter

Specification Vitocal 300-G

Brine/water heat pump specification

| Type BW/BWS | | 301.A21 | 301.A29 | 301.A45 |
|---|------|---------------------------------------|--------------------|--------------------|
| Performance data to EN 14511 (B0/W35, 5 K spread) | | | | |
| Rated heating output | kW | 21.2 | 28.8 | 42.8 |
| Cooling capacity | kW | 17.0 | 23.3 | 34.2 |
| Power consumption | kW | 4.48 | 5.96 | 9.28 |
| Coefficient of performance (COP) | | 4.73 | 4.83 | 4.60 |
| Brine (primary circuit) | | | | |
| Capacity | l | 6.5 | 8.5 | 11.5 |
| Minimum flow rate | l/h | 3300 | 4200 | 6500 |
| Pressure drop at minimum flow rate | mbar | 70 | 95 | 154 |
| | kPa | 7 | 9.5 | 15.4 |
| Max. flow temperature (brine inlet) | °C | 25 | 25 | 25 |
| Min. flow temperature (brine inlet) | °C | -10 | -10 | -10 |
| Heating water (secondary circuit) | | | | |
| Capacity | l | 6.5 | 8.5 | 11.5 |
| Nominal flow rate | l/h | 3740 | 5050 | 7360 |
| Pressure drop at nominal flow rate | mbar | 120 | 130 | 210 |
| | kPa | 12 | 13 | 21 |
| Minimum flow rate | l/h | 1900 | 2550 | 3700 |
| Pressure drop at minimum flow rate | mbar | 38 | 38 | 65 |
| | kPa | 3.8 | 3.8 | 6.5 |
| Max. flow temperature | °C | 60 | 60 | 60 |
| Electrical values, heat pump | | | | |
| Rated voltage, compressor | V | 3/PE 400 V/50 Hz | | |
| Rated current, compressor | A | 16 | 22 | 34 |
| Cos φ | | 0.8 | 0.8 | 0.8 |
| Starting current, compressor (with starting current limiter) | A | < 30 | 41 | 47 |
| Starting current, compressor with stalled armature | A | 95 | 118 | 174 |
| Compressor MCB/fuse protection | A | 1 x C16A 3-pole | 1 x C25A 3-pole | 1 x C40A 3-pole |
| Protection class | | I | I | I |
| Electrical values, heat pump control unit | | | | |
| Rated voltage, control unit/PCB | V | 1/N/PE 230 V/50 Hz | | |
| MCB/fuse protection, control unit/PCB | | 1 x B16A | | |
| MCB/fuse, control unit/PCB | A | 6.3 A (slow)/250 V | | |
| IP rating | | IP 20 | IP 20 | IP 20 |
| Power consumption | | | | |
| Max. power consumption, heat pump control unit/PCB, heat pump stage 1 (type BW 301.A) | W | 25 | 25 | 25 |
| Max. power consumption, PCB, heat pump stage 2 (type BWS 301.A) | | 20 | 20 | 20 |
| Power consumption, heat pump control unit/PCB, heat pump stages 1 and 2 | W | 45 | 45 | 45 |
| Refrigerant circuit | | | | |
| Refrigerant | | R410A | R410A | R410A |
| – Safety group | | A1 | A1 | A1 |
| – Refrigerant charge | kg | 4.7 | 6.2 | 7.7 |
| – Global warming potential (GWP)*1 | | 1924 | 1924 | 1924 |
| – CO ₂ equivalent | t | 9.0 | 11.9 | 14.8 |
| Permiss. operating pressure, high pressure side | bar | 43 | 43 | 43 |
| | MPa | 4.3 | 4.3 | 4.3 |
| Permiss. operating pressure, low pressure side | bar | 28 | 28 | 28 |
| | MPa | 2.8 | 2.8 | 2.8 |
| Compressor | Type | Hermetically sealed scroll compressor | | |
| Oil in compressor | Type | Emkarate RL32 3MAF | | |
| Quantity of oil in compressor | l | 2.65 | 3.25 | 3.38 |
| Permiss. operating pressure | | | | |
| Primary circuit | bar | 3 | 3 | 3 |
| | MPa | 0.3 | 0.3 | 0.3 |
| Secondary circuit | bar | 3 | 3 | 3 |
| | MPa | 0.3 | 0.3 | 0.3 |
| Dimensions | | | | |
| Total length | mm | 1085 | 1085 | 1085 |
| Total width | mm | 780 | 780 | 780 |
| Total height without programming unit | mm | 1074 | 1074 | 1074 |
| Total height (programming unit pivoted up, type BW 301.A only) | mm | 1267 | 1267 | 1267 |

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

Specification Vitocal 300-G (cont.)

| Type BW/BWS | | 301.A21 | 301.A29 | 301.A45 |
|---|-------|-----------------|-----------------|-----------------|
| Weight | | | | |
| Heat pump stage 1 (type BW 301.A) | kg | 245 | 272 | 298 |
| Heat pump stage 2 (type BWS 301.A) | kg | 240 | 267 | 293 |
| Connections (male thread) | | | | |
| Primary circuit flow/return | G | 2 | 2 | 2 |
| Secondary circuit flow/return | G | 2 | 2 | 2 |
| Sound power (measured with reference to EN 12102/EN ISO 9614-2) | | | | |
| Weighted total sound power level for B0±3 K/W35±5 K | | | | |
| – At rated heating output | dB(A) | 42 | 48 | 46 |
| Energy efficiency class to EU Regulation no. 813/2013 | | | | |
| Heating, average climatic conditions | | | | |
| – Low temperature applications (W35) | | A ⁺⁺ | A ⁺⁺ | A ⁺⁺ |
| – 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 | % | 201 | 211 | 199 |
| – Rated heating output P_{rated} | kW | 24 | 33 | 49 |
| – Seasonal coefficient of performance (SCOP) | | 5.23 | 5.48 | 5.18 |
| Medium temperature applications (W55) | | | | |
| – Energy efficiency η_s | % | 140 | 138 | 138 |
| – Rated heating output P_{rated} | kW | 22 | 30 | 45 |
| – Seasonal coefficient of performance (SCOP) | | 3.70 | 3.65 | 3.65 |

Water/water heat pump specification

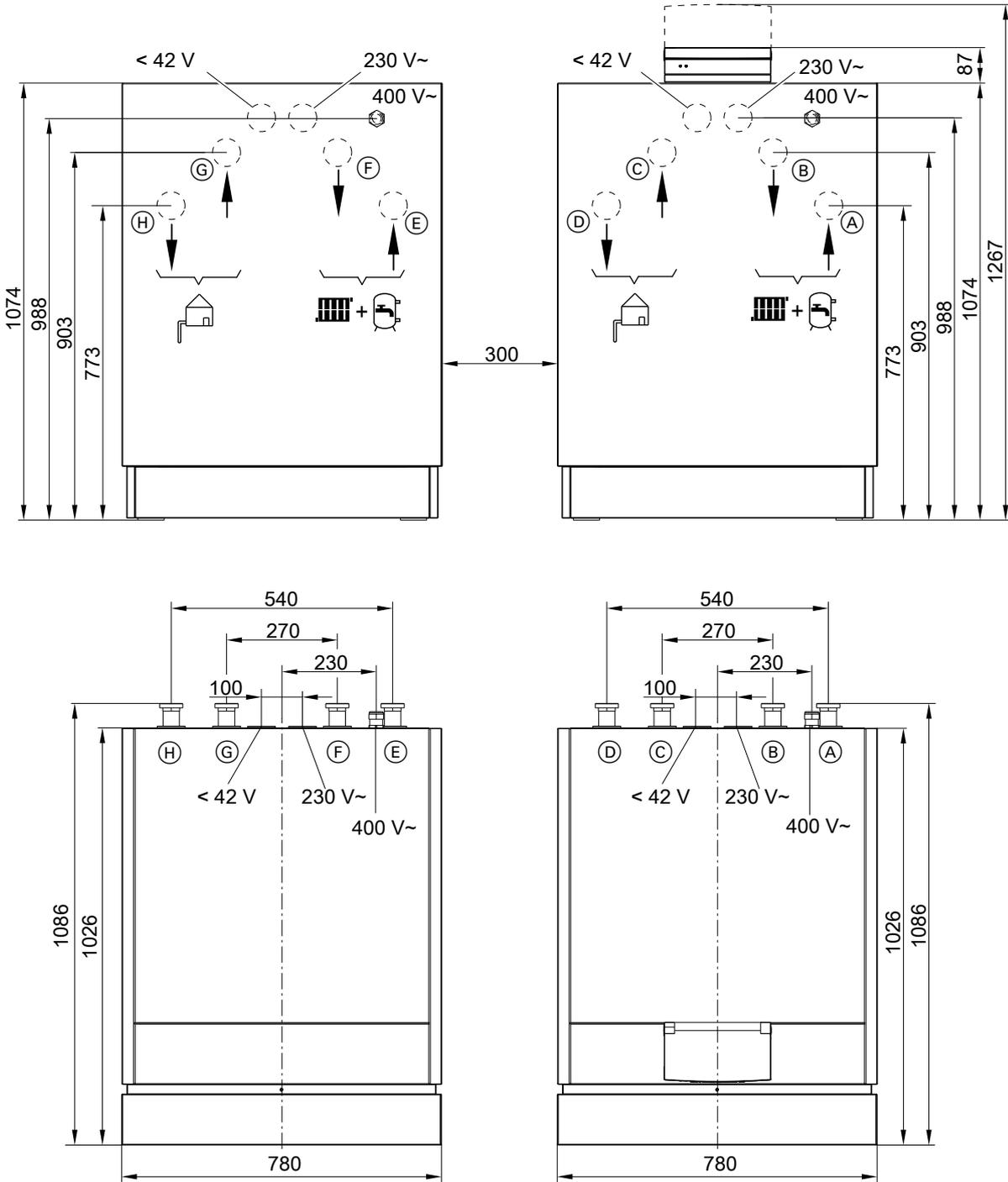
| Type BW/BWS in conjunction with conversion kit for water/water heat pump | | 301.A21 | 301.A29 | 301.A45 |
|--|------|---------|---------|---------|
| Performance data to EN 14511 (W10/W35, 5 K spread) | | | | |
| Rated heating output | kW | 28.1 | 37.1 | 58.9 |
| Cooling capacity | kW | 23.7 | 31.4 | 48.9 |
| Power consumption | kW | 4.73 | 6.2 | 10.7 |
| Coefficient of performance ϵ (COP) | | 5.94 | 6.00 | 5.50 |
| Brine (primary intermediate circuit) | | | | |
| Content | l | 6.5 | 8.5 | 11.5 |
| Minimum flow rate | l/h | 5200 | 7200 | 10600 |
| Pressure drop at minimum flow rate | mbar | 170 | 260 | 370 |
| | kPa | 17 | 26 | 37 |
| Max. flow temperature (brine inlet) | °C | 25 | 25 | 25 |
| Min. flow temperature (brine inlet) | °C | 7.5 | 7.5 | 7.5 |
| Heating water (secondary circuit) | | | | |
| Content | l | 6.5 | 8.5 | 11.5 |
| Minimum flow rate | l/h | 2420 | 3200 | 5100 |
| Pressure drop at minimum flow rate | mbar | 50 | 55 | 110 |
| | kPa | 5 | 5.5 | 11 |
| Max. flow temperature | °C | 60 | 60 | 60 |

Note

Further specifications: See "Specification for brine/water heat pumps"

Specification Vitocal 300-G (cont.)

Dimensions for type BW 301.A21 to A45, BWS 301.A21 to A45

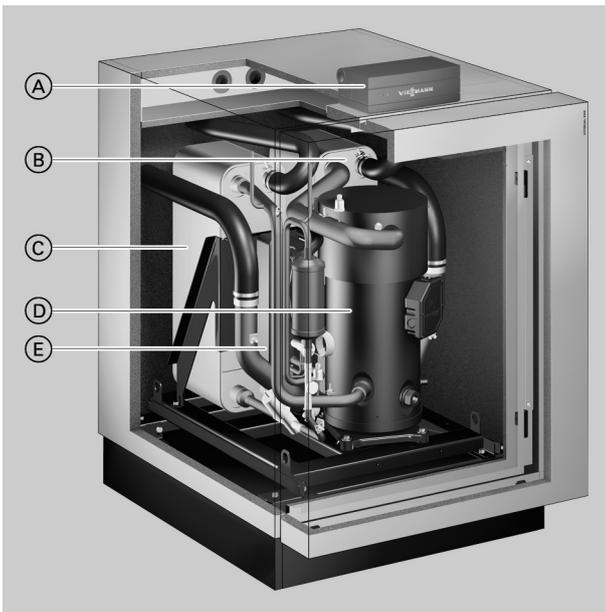


Type BWS on the left; type BW on the right

- (A)/(E) Secondary circuit return
- (B)/(F) Secondary circuit flow

- (C)/(G) Primary circuit flow (heat pump brine inlet)
- (D)/(H) Primary circuit return (heat pump brine outlet)

Vitocal 350-G benefits



- Ⓐ Vitotronic 200 weather-compensated, digital heat pump control unit
- Ⓑ Condenser
- Ⓒ Evaporator
- Ⓓ Hermetically sealed Compliant scroll compressor with enhanced vapour injection — EVI process
- Ⓔ Heat exchanger for enhanced vapour injection

- Low running costs thanks to high COP (coefficient of performance) to EN 14511: Up to 5.0 (B0/W35)
- Mono mode operation for central heating and DHW heating
- Flow temperatures up to 68 °C
- Achievable DHW temperature of up to 60 °C when using the specified cylinder combinations
- Low noise and vibration levels through sound-optimised appliance design – sound power level < 52 dB(A)
- Low running costs with the highest level of efficiency at any operating point through the innovative Refrigerant Cycle Diagnostic system (RCD) with electronic expansion valve (EEV)
- With the 2-stage version (type BW+BWS):
Highly flexible due to option of combining modules of different outputs
Easier handling through smaller and lighter modules

Only type BW:

- Easy to use Vitotronic control unit with plain text and graphic display for weather-compensated heating operation, with natural cooling and active cooling functions
- Optimised utilisation of power generated by an on-site photovoltaic system
- Web-enabled through Vitoconnect (accessories) for operation and service via Viessmann apps

Delivered condition, type BW

- Complete compact heat pump as a 1-stage heat pump or as stage 1 (master) of a 2-stage heat pump
- Adjustable anti-vibration feet

- Weather-compensated Vitotronic 200 heat pump control unit with outside temperature sensor
- Electronic starting current limiter and integral phase monitor

Delivered condition, type BWS

- Compact heat pump as stage 2 (slave)
- Adjustable anti-vibration feet

- Electrical connecting cable for connection to stage 1 (master).
- Electronic starting current limiter

Specification Vitocal 350-G

Brine/water heat pump specification

| Type BW/BWS | | 351.B20 | 351.B27 | 351.B33 | 351.B42 |
|---|------|---------------------------------------|--------------------|--------------------|--------------------|
| Performance data to EN 14511 (B0/W35, 5 K spread) | | | | | |
| Rated heating output | kW | 20.5 | 28.7 | 32.7 | 42.3 |
| Cooling capacity | kW | 16.4 | 23.0 | 26.3 | 33.6 |
| Power consumption | kW | 4.30 | 5.90 | 6.50 | 8.70 |
| Coefficient of performance (COP) | | 4.80 | 4.90 | 5.00 | 4.80 |
| Brine (primary circuit) | | | | | |
| Capacity | l | 9 | 11 | 14 | 14 |
| Nominal flow rate (3 K spread) | l/h | 5350 | 7200 | 8300 | 10500 |
| Pressure drop at nominal flow rate | mbar | 100 | 50 | 84 | 124 |
| | kPa | 10.0 | 5.0 | 8.4 | 12.4 |
| Minimum flow rate (4 K spread) | l/h | 4000 | 5400 | 6200 | 7900 |
| Pressure drop at minimum flow rate | mbar | 63 | 30 | 52 | 78 |
| | kPa | 6.3 | 3.0 | 5.2 | 7.8 |
| Max. flow temperature (brine inlet) | °C | 25 | 25 | 25 | 25 |
| Min. flow temperature (brine inlet) | °C | -10 | -10 | -10 | -10 |
| Heating water (secondary circuit) | | | | | |
| Capacity | l | 8 | 9 | 13 | 13 |
| Nominal flow rate (5 K spread) | l/h | 3500 | 4800 | 5650 | 7000 |
| Pressure drop at nominal flow rate | mbar | 42 | 40 | 65 | 99 |
| | kPa | 4.2 | 4.0 | 6.5 | 9.9 |
| Minimum flow rate (12 K spread) | l/h | 1500 | 2050 | 2400 | 3000 |
| Pressure drop at minimum flow rate | mbar | 7 | 10 | 16 | 23 |
| | kPa | 0.7 | 1.0 | 1.6 | 2.3 |
| Max. flow temperature (6 K spread) | °C | 65 | 68 | 68 | 68 |
| Electrical values, heat pump | | | | | |
| Rated voltage, compressor | V | 3/PE 400 V/50 Hz | | | |
| Rated current, compressor | A | 13.2 | 21 | 26 | 33 |
| Cos φ | | 0.8 | 0.8 | 0.8 | 0.8 |
| Starting current, compressor (with starting current limiter) | A | 36 | 39 | 43 | 59 |
| Starting current, compressor with stalled armature | A | 101 | 118 | 140 | 174 |
| Compressor MCB/fuse protection | A | 1 x C25A 3-pole | 1 x C32A 3-pole | 1 x C32A 3-pole | 1 x C40A 3-pole |
| Protection class | | I | I | I | I |
| Electrical values, heat pump control unit | | | | | |
| Rated voltage, heat pump control unit/PCB | V | 1/N/PE 230 V/50 Hz | | | |
| Fuse rating, heat pump control unit/PCB | | 1 x B16A | | | |
| Fuse, heat pump control unit/PCB | A | 6.3 A (slow)/250 V | | | |
| IP rating | | IP 20 | IP 20 | IP 20 | IP 20 |
| Power consumption | | | | | |
| Max. power consumption, heat pump control unit/PCB, heat pump stage 1 (type BW 351.B) | W | 25 | 25 | 25 | 25 |
| Max. power consumption, PCB, heat pump stage 2 (type BWS 351.B) | | 20 | 20 | 20 | 20 |
| Power consumption, heat pump control unit/PCB, heat pump stages 1 and 2 | W | 45 | 45 | 45 | 45 |
| Refrigerant circuit | | | | | |
| Refrigerant | | R410A | R410A | R410A | R410A |
| - Safety group | | A1 | A1 | A1 | A1 |
| - Refrigerant charge | kg | 5.3 | 7.0 | 8.6 | 8.7 |
| - Global warming potential (GWP)* ² | | 1924 | 1924 | 1924 | 1924 |
| - CO ₂ equivalent | t | 10.2 | 13.5 | 16.5 | 16.7 |
| Permiss. operating pressure, high pressure side | bar | 45 | 45 | 45 | 45 |
| | MPa | 4.5 | 4.5 | 4.5 | 4.5 |
| Permiss. operating pressure, low pressure side | bar | 28 | 28 | 28 | 28 |
| | MPa | 2.8 | 2.8 | 2.8 | 2.8 |
| Compressor | Type | Hermetically sealed scroll compressor | | | |
| Oil in compressor | Type | Emkarate RL32 3MAF | | | |
| Quantity of oil in compressor | l | 1.9 | 3.4 | 3.4 | 3.4 |
| Permiss. operating pressure | | | | | |
| Primary circuit | bar | 3 | 3 | 3 | 3 |
| | MPa | 0.3 | 0.3 | 0.3 | 0.3 |
| Secondary circuit | bar | 3 | 3 | 3 | 3 |
| | MPa | 0.3 | 0.3 | 0.3 | 0.3 |

Specification Vitocal 350-G (cont.)

| Type BW/BWS | | 351.B20 | 351.B27 | 351.B33 | 351.B42 |
|---|-------|-----------------|-----------------|-----------------|-----------------|
| Dimensions | | | | | |
| Total length | mm | 1085 | 1085 | 1085 | 1085 |
| Total width | mm | 780 | 780 | 780 | 780 |
| Total height without programming unit | mm | 1074 | 1074 | 1074 | 1074 |
| Total height (programming unit pivoted up, type BW 351.B only) | mm | 1267 | 1267 | 1267 | 1267 |
| Weight | | | | | |
| Heat pump stage 1 (type BW 351.B) | kg | 270 | 285 | 310 | 315 |
| Heat pump stage 2 (type BWS 351.B) | kg | 265 | 280 | 305 | 310 |
| Connections (male thread) | | | | | |
| Primary circuit flow/return | G | 2 | 2 | 2 | 2 |
| Secondary circuit flow/return | G | 2 | 2 | 2 | 2 |
| Sound power (measured with reference to EN 12102/ EN ISO 9614-2) | | | | | |
| Weighted total sound power level for $B0^{\pm 3 K}/W35^{\pm 5 K}$ | | | | | |
| – At rated heating output | dB(A) | 50 | 52 | 50 | 50 |
| Energy efficiency class to EU Regulation no. 813/2013 | | | | | |
| Heating, average climatic conditions | | | | | |
| – Low temperature applications (W35) | | A ⁺⁺ | A ⁺⁺ | A ⁺⁺ | A ⁺⁺ |
| – Medium temperature applications (W55) | | A ⁺⁺ | A ⁺⁺ | A ⁺⁺ | A ⁺⁺ |
| Performance data as per EU Regulation no. 813/2013 (average climatic conditions) | | | | | |
| Low temperature applications (W35) | | | | | |
| – Energy efficiency η_s | % | 196 | 203 | 213 | 203 |
| – Rated heating output P_{rated} | kW | 23 | 32 | 37 | 48 |
| – Seasonal coefficient of performance (SCOP) | | 5.10 | 5.28 | 5.53 | 5.28 |
| Medium temperature applications (W55) | | | | | |
| – Energy efficiency η_s | % | 152 | 153 | 156 | 153 |
| – Rated heating output P_{rated} | kW | 23 | 34 | 38 | 49 |
| – Seasonal coefficient of performance (SCOP) | | 4.00 | 4.03 | 4.10 | 4.03 |

Water/water heat pump specification

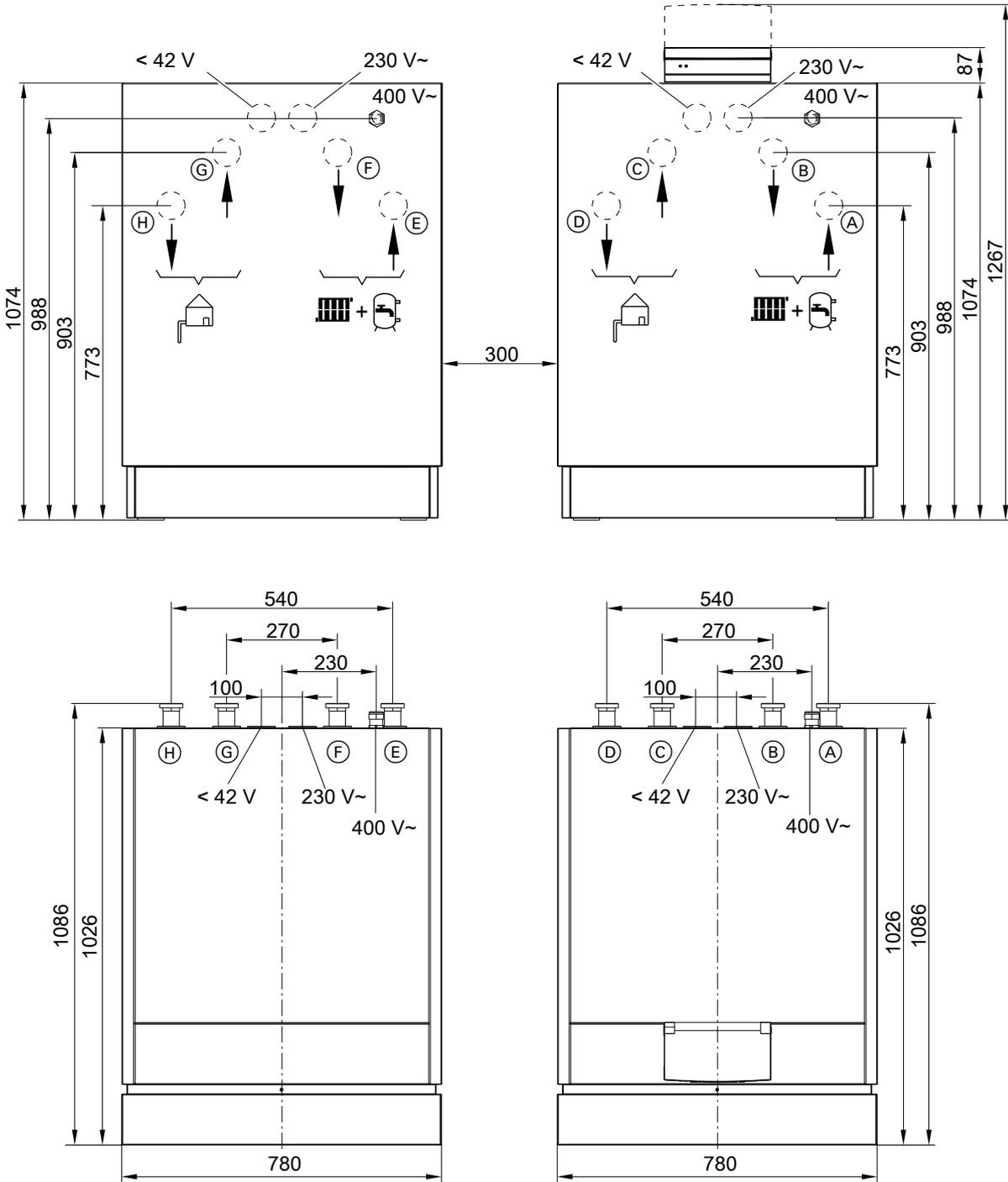
| Type BW/BWS in conjunction with "conversion kit for water/water heat pump" | | 351.B20 | 351.B27 | 351.B33 | 351.B42 |
|--|------|---------|---------|---------|---------|
| Performance data to EN 14511 (W10/W35, 5 K spread) | | | | | |
| Rated heating output | kW | 25.4 | 34.7 | 42.2 | 52.3 |
| Cooling capacity | kW | 21.1 | 29.3 | 35.7 | 43.8 |
| Power consumption | kW | 4.50 | 5.70 | 6.80 | 9.00 |
| Coefficient of performance (COP) | | 5.70 | 6.10 | 6.20 | 5.80 |
| Brine (primary intermediate circuit) | | | | | |
| Capacity | l | 9 | 11 | 14 | 14 |
| Nominal flow rate (3 K spread) | l/h | 6400 | 9500 | 10300 | 14000 |
| Pressure drop at nominal flow rate | mbar | 145 | 80 | 120 | 320 |
| | kPa | 14.5 | 8.0 | 12.0 | 32.0 |
| Minimum flow rate (5 K spread) | l/h | 4800 | 6500 | 7700 | 10500 |
| Pressure drop at minimum flow rate | mbar | 90 | 42 | 77 | 124 |
| | kPa | 9.0 | 4.2 | 7.7 | 12.4 |
| Max. flow temperature (brine inlet) | °C | 25 | 25 | 25 | 25 |
| Min. flow temperature (brine inlet) | °C | 7.5 | 7.5 | 7.5 | 7.5 |
| Heating water (secondary circuit) | | | | | |
| Capacity | l | 8 | 9 | 13 | 13 |
| Nominal flow rate (5 K spread) | l/h | 4300 | 5700 | 7300 | 9000 |
| Pressure drop at nominal flow rate | mbar | 68 | 53 | 105 | 154 |
| | kPa | 6.8 | 5.3 | 10.5 | 15.4 |
| Minimum flow rate (12 K spread) | l/h | 1800 | 2400 | 3050 | 3750 |
| Pressure drop at minimum flow rate | mbar | 11 | 13 | 23.0 | 33 |
| | kPa | 1.1 | 1.3 | 2.3 | 3.3 |
| Max. flow temperature (6 K spread) | °C | 65 | 68 | 68 | 68 |

Note

Further specifications: See "Specification for brine/water heat pumps".

Specification Vitocal 350-G (cont.)

Dimensions for type BW 351.B20 to B42, BWS 351.B20 to B42



Type BWS on the left; type BW on the right

- (A)/(E) Secondary circuit return
- (B)/(F) Secondary circuit flow

- (C)/(G) Primary circuit flow (heat pump brine inlet)
- (D)/(H) Primary circuit return (heat pump brine outlet)

Subject to technical modifications.

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