

Vertomat

gas-fired condensing boiler

Input capacities 187 kW – 985 kW
638,000 – 3,361,000 Btu/h

Type: VSB

VIESSMANN

Technical Data Sheet

For prices, please see separate price sheet



Gas-fired condensing boiler

with vertical "Inox-Crossal" heat exchanger surfaces made from high grade stainless steel.

For operation without low limit on boiler return water temperature.

For closed hot water heating systems with maximum supply water temperatures of 99°C – 210°F for a maximum operating pressure of 30 psi.

Advantages:

- Optimized condensing boiler design
- Vertical heat exchanger surfaces manufactured from high-alloy stainless steel, corrosion-resistant, to guarantee long service life
- Seasonal efficiency ratings in excess of 95% – Manufacturer's efficiency statement.
- Reduced NO_x emissions due to combustion chamber geometry



Content of delivery:

Boiler shell complete with insulation jacket and pressure relief valve.
Burner as per selection (priced separately) or to be field-supplied by mechanical contractor.
As per specification, all models of burners to be of make Weishaupt.

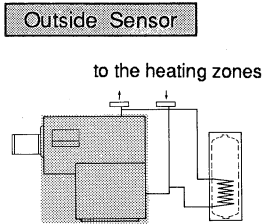
The appropriate Weishaupt burner model may be ordered together with the boiler or can be ordered directly through Weishaupt Canada Ltd., 6150 Kennedy Rd., Unit 8, Mississauga, Ont., L5T 2J4.

The Vertomat VSB boiler series must be used with a **Viessmann control Dekamatik** as per selection chart below.

Dekamatik-DE

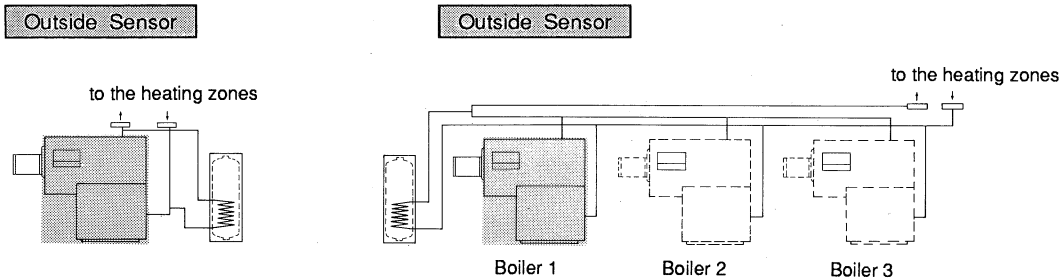
for single boiler with one- or two-stage burner or fully modulating burner and maximum two heating circuits* with mixing valves, including domestic hot water tank, temperature control, and integrated diagnostic system

* For each heating circuit, an additional mixing valve including mixing valve motor and supply sensor is necessary.



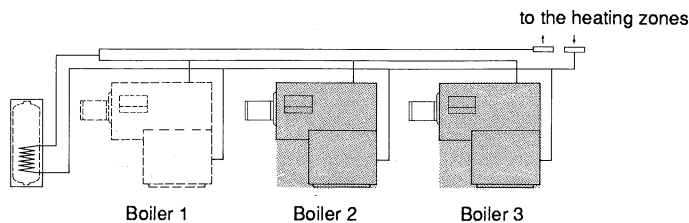
Dekamatik-D1

for single boiler systems or to be used as the lead control for the first heating boiler in a multiple boiler system with one-stage, two-stage, or fully modulating burner.
Including domestic hot water tank, temperature control, lead boiler selection switch, integrated diagnostic system, without mixing valve control



Dekamatik-D2

as additional control to supplement Dekamatik-D1 for the second or third heating boiler in a multiple boiler system with one-stage, two-stage, or fully modulating burners.
With integrated diagnostic system; no mixing valve control



Technical Data

| Boiler Model No. | VS-17 | VS-22 | VS-28 | VS-37 | VS-46 | VS-57 | VS-72 | VS-89 |
|--|--|--|---|--|---|---|---|---|
| Max. input kW Btu/h | 187 638,000 | 248 846,000 | 314 1,071,000 | 407 4,389,000 | 506 1,726,000 | 633 2,160,000 | 792 2,702,000 | 985 3,361,000 |
| Combustion efficiency ¹⁾ at boiler supply – boiler return temperatures of 80/60°C – 176/140°F 70/50°C – 158/122°F 40/30°C – 104/86°F and max. input | 86.8% 90.2% 95.1% | 86.8% 90.2% 95.1% | 86.8% 90.2% 95.1% | 86.8% 90.2% 95.1% | 87% 90.4% 95.3% | 87% 90.4% 95.3% | 87% 90.4% 95.3% | 87% 90.4% 95.3% |
| Boiler output at 80/60°C – 176/140°F 70/50°C – 158/122°F 40/30°C – 104/86°F | kW Btu 162.3 553,800 168.7 575,500 177.8 606,700 | kW Btu 215.3 734,300 223.7 763,100 235.8 804,500 | kW Btu 272.6 929,600 283.2 966,000 298.6 1,018,500 | kW Btu 353.3 1,205,700 367.1 1,252,900 387.1 1,320,900 | kW Btu 440.2 1,501,600 457.4 1,560,300 482.2 1,644,900 | kW Btu 550.7 1,879,200 572.2 1,952,600 603.2 2,058,500 | kW Btu 689.0 2,350,700 716.0 2,442,600 754.8 2,575,000 | kW Btu 857.0 2,924,000 890.4 3,038,300 938.7 3,203,000 |
| Boiler stand-by loss at max. input | Watt Btu % of max. input 752 2566 0.40 627 2139 0.34 251 856 0.13 | Watt Btu % of max. input 826 2818 0.33 688 2347 0.28 275 938 0.11 | Watt Btu % of max. input 898 3064 0.29 748 2552 0.24 299 1020 0.10 | Watt Btu % of max. input 1050 3583 0.25 893 3047 0.22 335 1143 0.08 | Watt Btu % of max. input 1260 4299 0.25 1050 3583 0.21 420 1433 0.08 | Watt Btu % of max. input 1536 5240 0.24 1280 4367 0.20 512 1747 0.08 | Watt Btu % of max. input 1686 5753 0.21 1405 4794 0.18 562 1918 0.07 | Watt Btu % of max. input 1944 6633 0.20 1686 5753 0.17 648 2211 0.07 |
| Dimensions – boiler shell Length ²⁾ mm – inch Width mm – inch Height mm – inch | 1516 684 1728 | 1594 684 1778 | 1675 684 1778 | 1751 796 1987 | 1829 796 1987 | 1985 796 1987 | 2095 951 2187 | 2289 951 2187 |
| Dimensions – jacket installed Total length mm – inch Width mm – inch Width incl. mm – inch Total height mm – inch | 1593 799 1160 1943 | 1671 799 1160 1993 | 1752 799 1160 2032 | 1828 916 2280 | 1906 916 2280 | 2062 916 2280 | 2172 990 2537 | 2366 990 2537 |
| Recommended size of foundation Length mm – inch Width mm – inch Height mm – inch | 1000 800 100 | 1100 800 100 | 1200 800 100 | 1250 900 100 | 1300 900 100 | 1500 900 100 | 1500 1000 100 | 1650 1000 100 |
| Weight of boiler shell kg – lbs Weight incl. insulation (less burner) kg – lbs | 430 505 | 535 615 | 590 680 | 670 780 | 765 905 | 805 965 | 1230 1370 | 1370 1520 |
| Boiler water content ltr – USG | 270 | 296 | 330 | 490 | 533 | 570 | 754 | 840 |
| Heat exchanger surface water cooled m ² – sq. ft. | 8.3 | 9.9 | 11.8 | 15.1 | 17.1 | 20.5 | 28.4 | 34.6 |
| Max. operating temperature °C – °F Max. operating pressure kPa – psi | 99 210 30 | 99 210 30 | 99 210 30 | 99 210 30 | 99 210 30 | 99 210 30 | 99 210 30 | 99 210 30 |
| Flue gas resistance Pa – "w.c. | 100 | 140 | 160 | 200 | 220 | 270 | 300 | 330 |

¹⁾ Manufacturer's efficiency statements
²⁾ Less combustion chamber door

| Boiler Model No. | VSB-17 | | VSB-22 | | VSB-28 | | VSB-37 | | VSB-46 | | VSB-57 | | VSB-72 | | VSB-89 | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| All tests performed at boiler water supply temp. of 80°C – 176°F and boiler water return temp. of 60°C – 140°F | | | | | | | | | | | | | | | | |
| I = partial input II = maximum input | I | II | I | II | I | II | I | II | I | II | I | II | I | II | I | II |
| Input kW | 73 | 177 | 53 | 235 | 108 | 296 | 144 | 386 | 118 | 480 | 135 | 600 | 265 | 749 | 314 | 931 |
| Comb. chbr. pressure Pa | + 22 | + 90 | + 8 | + 149 | + 30 | + 161 | + 5 | + 80 | + 22 | + 230 | - 22 | - 218 | + 40 | + 220 | + 45 | + 220 |
| Pressure at boiler flue outlet Pa | ± 0 | - 3 | - 3 | - 4 | ± 0 | - 2 | - 5 | ± 0 | ± 0 | ± 0 | ± 0 | ± 0 | ± 0 | ± 0 | ± 0 | ± 0 |
| Blower pressure Pa | 100 | 850 | 30 | 780 | 130 | 850 | 100 | 550 | 80 | 930 | 80 | 980 | 150 | 1080 | 1100 | 1200 |
| Airgate position ° | 1.0 | 4.0 | 1.3 | 5.5 | 1.5 | 6.0 | 1.5 | 4.5 | 1.4 | 9.0 | 1.3 | 7.0 | 0.3 | 3.4 | 0.3 | 2.7 |
| CO ² Vol. % | 10.0 | 10.0 | 10.0 | 10.0 | 9.8 | 9.95 | 9.62 | 9.98 | 9.38 | 9.99 | 9.1 | 10.15 | 9.53 | 10.0 | 9.58 | 10.0 |
| CO airfree ppm | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 11 | 0 | 1 | 10 | 1 | 23 |
| NO _x (NO ₂) airfree ppm | 39 | 32 | 64 | 53 | 52 | 46 | 52 | 43 | 83 | 63 | 82 | 63 | 62 | 59 | 71 | 69 |
| Flue temp. gross °C – °F | 64 147 | 71 160 | 58 136 | 72 162 | 64 147 | 78 172 | 54 129 | 75 167 | 61 142 | 70 158 | 61 142 | 74 165 | 70 158 | 72 162 | 70 158 | 68 154 |
| Room temperature °C – °F | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 | 20 68 |

¹⁾ Boiler has two return connections – the heating return with the lower temperature should be connected to boiler return BR1.

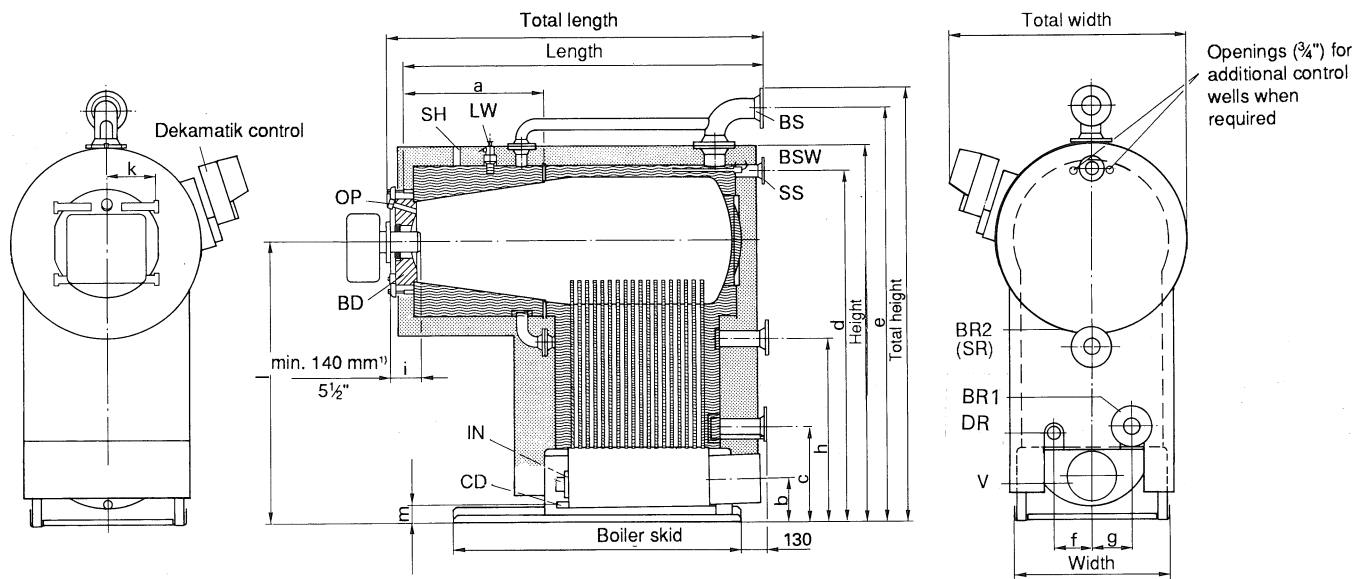
²⁾ Only the Weishaupt burner model stated is CGA certified with the Vertomat boiler series.

³⁾ Gas train weight extra

⁴⁾ Combustion heads must be heat resistant to a minimum of 500°C – 932°F.

⁵⁾ See Weishaupt Burner Manual for details on burner

⁶⁾ If gas supply pressure is lower than 8" w.c., consult burner manufacturer – Weishaupt.



- Legend:
- | | | |
|--------------------------|--------------------------|------------------------|
| V = Vent pipe connection | BR2 = Boiler return 2 | OP = Observation port |
| DR = Boiler drain | BSW = Boiler sensor well | SS = Safety supply |
| CD = Condensate drain | BD = Boiler door | SR = Safety return |
| BR1 = Boiler return 1 | BS = Boiler supply | LW = Low water cut-off |
| | IN = Inspection opening | SH = Safety Header |

| Boiler Model | a | | b | | c | | d | | e | | f | | g | |
|--------------|-----|--------|-----|--------|-----|--------|------|--------|------|--------|-----|-------|-----|------|
| | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| VSB-17 | 730 | 28 3/4 | 296 | 11 3/4 | 519 | 20 1/2 | 1595 | 62 3/4 | 1863 | 73 1/4 | 227 | 9 | 177 | 7 |
| VSB-22 | 730 | 28 3/4 | 296 | 11 3/4 | 519 | 20 1/2 | 1645 | 64 3/4 | 1913 | 75 1/4 | 227 | 9 | 177 | 7 |
| VSB-28 | 730 | 28 3/4 | 296 | 11 3/4 | 519 | 20 1/2 | 1645 | 64 3/4 | 1937 | 76 1/4 | 221 | 8 3/4 | 177 | 7 |
| VSB-37 | 755 | 29 3/4 | 323 | 12 3/4 | 576 | 22 3/4 | 1854 | 73 | 2175 | 85 1/2 | 241 | 9 1/2 | 200 | 8 |
| VSB-46 | 755 | 29 3/4 | 323 | 12 3/4 | 576 | 22 3/4 | 1854 | 73 | 2175 | 85 1/2 | 241 | 9 1/2 | 200 | 8 |
| VSB-57 | 755 | 29 3/4 | 323 | 12 3/4 | 576 | 22 3/4 | 1854 | 73 | 2175 | 85 1/2 | 241 | 9 1/2 | 200 | 8 |
| VSB-72 | 755 | 29 3/4 | 363 | 14 1/4 | 644 | 25 1/4 | 2043 | 80 1/2 | 2417 | 95 1/4 | 280 | 11 | 250 | 10 |
| VSB-89 | 755 | 29 3/4 | 363 | 14 1/4 | 644 | 25 1/4 | 2043 | 80 1/2 | 2417 | 95 1/4 | 280 | 11 | 250 | 10 |

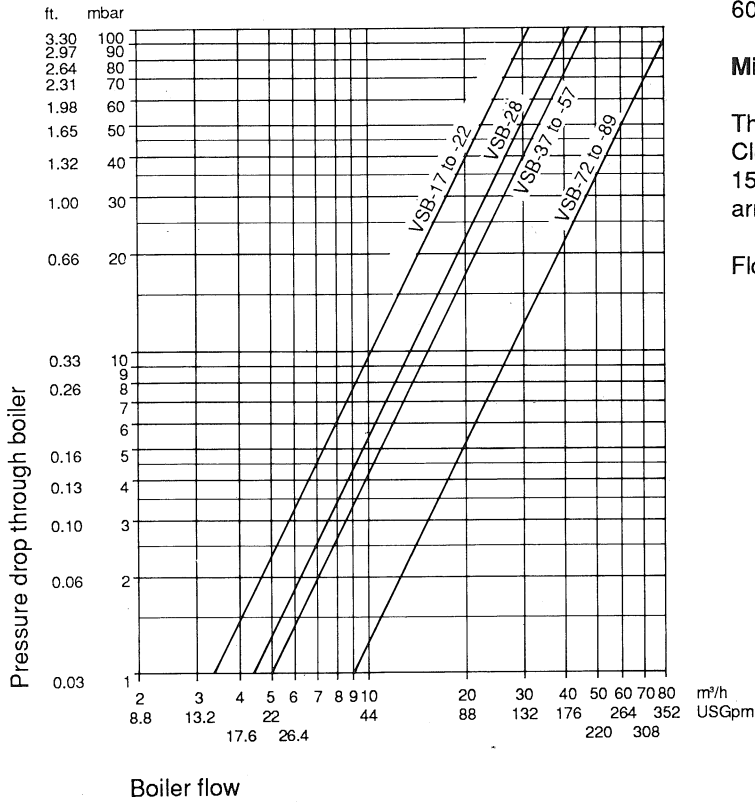
| Boiler Model | h | | i ¹⁾ max. | | k | | l | | m | | r ²⁾ | | Boiler skid | |
|--------------|-----|--------|----------------------|--------|-----|--------|------|--------|-----|-------|-----------------|--------|-------------|--------|
| | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| VSB-17 | 802 | 31 1/2 | 297 | 11 3/4 | 257 | 10 | 1299 | 51 1/4 | 192 | 7 1/2 | 474 | 18 3/4 | 895 | 35 1/4 |
| VSB-22 | 852 | 33 1/2 | 297 | 11 3/4 | 257 | 10 | 1349 | 53 | 192 | 7 1/2 | 474 | 18 3/4 | 973 | 38 1/4 |
| VSB-28 | 852 | 33 1/2 | 297 | 11 3/4 | 257 | 10 | 1349 | 53 | 192 | 7 1/2 | 474 | 18 3/4 | 1051 | 41 1/4 |
| VSB-37 | 921 | 36 1/4 | 318 | 12 1/2 | 284 | 11 1/4 | 1500 | 59 | 188 | 7 1/2 | 527 | 20 3/4 | 1192 | 47 |
| VSB-46 | 921 | 36 1/4 | 318 | 12 1/2 | 284 | 11 1/4 | 1500 | 59 | 188 | 7 1/2 | 527 | 20 3/4 | 1270 | 50 |
| VSB-57 | 921 | 36 1/4 | 318 | 12 1/2 | 284 | 11 1/4 | 1500 | 59 | 188 | 7 1/2 | 527 | 20 3/4 | 1426 | 56 1/4 |
| VSB-72 | 965 | 38 | 427 | 16 3/4 | 360 | 14 | 1621 | 63 3/4 | 197 | 7 3/4 | 677 | 26 1/2 | 1426 | 56 1/4 |
| VSB-89 | 965 | 38 | 427 | 16 3/4 | 360 | 14 | 1621 | 63 3/4 | 197 | 7 3/4 | 677 | 26 1/2 | 1621 | 63 3/4 |

¹⁾ The minimum combustion head length of 140 mm – 5 1/2" must be maintained. When a burner with a shorter combustion head is utilized, all functions including combustion results must be verified. The maximum combustion head length must also be observed so that the burner mounted on the hinged combustion chamber door can swing into service position. Radius of door hinge to outside combustion head: 476 mm – 18 3/4".

²⁾ Radius door hinge to combustion head tip.

For ease of handling, burner door can be removed as well as the front combustion chamber can be hinged off.

Pressure drop through boiler – water side



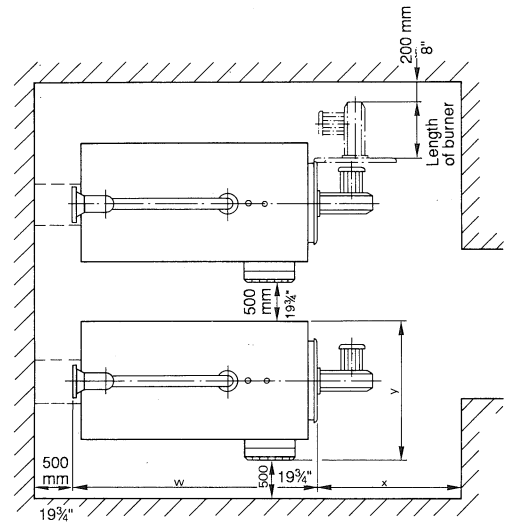
Minimum clearances for proper service access

For proper service access maintain a minimum clearance of 600 mm (24") on all 4 sides of boiler.

Minimum clearances to combustible construction

The burner door can be hinged on left or right boiler side. Clearance to ceiling 300 mm – 12", may be reduced to 150 mm – 6" if piping of boiler supply can be properly arranged.

Floor: Combustible or non-combustible.



| Boiler Model | w | | x | | y | |
|--------------|------|--------------------------------|------|--------------------------------|------|--------------------------------|
| | mm | inch | mm | inch | mm | inch |
| VSB-17 | 1593 | 62 ³ / ₄ | 930 | 36 ¹ / ₂ | 1160 | 45 ³ / ₄ |
| VSB-22 | 1671 | 65 ³ / ₄ | 1000 | 39 ¹ / ₄ | 1160 | 45 ³ / ₄ |
| VSB-28 | 1752 | 69 | 1100 | 43 ¹ / ₄ | 1160 | 45 ³ / ₄ |
| VSB-37 | 1828 | 72 | 1500 | 59 | 1260 | 49 ¹ / ₂ |
| VSB-46 | 1906 | 75 | 1500 | 59 | 1260 | 49 ¹ / ₂ |
| VSB-57 | 2062 | 81 ¹ / ₄ | 1500 | 59 | 1260 | 49 ¹ / ₂ |
| VSB-72 | 2172 | 85 ¹ / ₂ | 1500 | 59 | 1445 | 57 |
| VSB-89 | 2366 | 93 ¹ / ₄ | 1500 | 59 | 1445 | 57 |

Boiler venting

Depending on the boiler return water temperature, the flue gases in the boiler series Vertomat are cooled down into the condensation or dew point area of the flue gases. Where they exit the boiler, they reach a relative moisture of 100%. The vent temperature is between 5°C and 15°C (9°F and 27°F) higher than the boiler return water temperature. Therefore, depending on the attached heating system, the flue gas temperature can be between 25°C (77°F) and 93°C (227°F). Due to the low flue gas temperature and the resulting minute updraft conditions as well as the additional condensation of the flue gases in the venting system, the vent system must be properly designed by the manufacturer and suitable materials must be selected.

Suitable as vent pipe material is stainless steel of the grade 316 L. The chimney must be designed to be gas and water tight.

The following manufacturers may be contacted for suitable stainless steel chimneys:

Selkirk Metalbestos

Eljer Manufacturing Canada Inc.,
3070 Universal Drive,
Mississauga, Ontario L4X 2C8
Tel.: (416) 629-3113
(416) 629-2797
Fax: (416) 624-5583

Security Chimneys,

Division of Security Chimneys Ltd.,
2125 Monterey,
Laval, Quebec H7L 3T6
Tel.: (514) 973-9999
(514) 337-3387
Fax: (514) 687-9569

Where possible and feasible, these boilers can also be vented directly through the wall with a maximum length of vent pipe of 20 ft. with a maximum of four 90° elbows installed.

CPVC might also be utilized for vent pipe material. Please direct enquiries to Viessmann Manufacturing for assistance.

Condensate and its disposal

During the operation of the Vertomat boiler series, the amount of condensate as per the diagram below can be expected.

The values given are approximate amounts occurring under practical conditions. Not included in the chart is the amount of condensate occurring in the vent pipe and chimney system. The condensate from the chimney system can be collected together with the condensate from the heating boiler and be disposed of into a floor drain. The condensate developing will be between 3 and 4 on the pH scale. If local building requirements demand neutralizing the condensate before disposal, contact Viessmann Manufacturing for a correct size of neutralization tank. The condensate treated will show pH values between 6.5 and 9 and can then be disposed of into the waste water system.

