

Material checklist — vent and air piping

Items	Material	Standards for installations in:	
		United States	Canada
PLASTIC piping materials (vent or air piping)			
Pipe & Fittings	PVC schedule 40	D1785	Plastic vent pipe must be certified to ULC S636 when required. (Note 2)
	PVC-DWV (Note 1)	D2665	
	CPVC sch 40 (Note 1)	F441	
	ABS-DWV sch 40 (Note 1)	D2661	
Cement	PVC	D2564	Air pipe can be any of those listed at left if acceptable for local codes.
	CPVC (Note 1)	F493	
	ABS (Note 1)	D2235	
Primer	PVC, CPVC or ABS	F656	

Ultra model	Vent or air pipe size	• Allowable sizes of vent/air piping • Max. equivalent feet of each • Number of elbows allowed at these lengths (All applications include allowance for the termination.)									
		Sidewall Direct Vent with Well-McLain Vent/Air cap		Sidewall or Vertical Direct Exhaust		Sidewall or Vertical Direct Vent with 3" PVC Concentric		Sidewall or Vertical Direct Vent with 4" PVC Concentric		Vertical Direct Vent with Separate Pipes	
		Length	Ells	Length	Ells	Length	Ells	Length	Ells	Length	Ells
80 or 105	2" **	100 (ab)	2	100	2	100 (ab)	1	NA		100 (a)	1
155	3"	100	2	100	2	100	1	NA		100	1
230	3"	30 (c)	2	30 (c)	2	30 (c)	1	30 (c)	1	30 (c)	1
	4"	100 (d)	2	100	2	70 (d)	1	70 (d)	1	100	1
299	4"	100	2	100	2	70 (d)	1	100	1	100	1
399	4"	100	2	100	2	NA		100	1	100	1

Equivalent feet for elbows — deduct from maximum equivalent length of piping:
 • 7 feet per each 4-inch elbow & 2 or 3-inch 90° long-radius or 45° elbow
 • 16 feet for each 2- or 3-inch short-radius elbow
a — Use 3"x2" reducer at boiler **b** — Use 3"x2" PVC reducers at termination
c — Use 4"x3" reducer at boiler **d** — Use 4"x3" PVC reducers at termination

Stainless (AL29-4C) vent pipe — install an adapter at the boiler for all applications. Also install an adapter at the termination unless using separate-pipe termination.

** Ultra-80 and 105 boilers installed with 2-inch vent piping automatically derate due to the pressure loss in the vent and air piping. The derate ranges up to 10% for the Ultra-80 at 100 feet or 15% for the Ultra-105 at 100 feet.

Note 1: IPEX 3" and 4" PVC concentric vent kits can be used with standard PVC pipe, fittings and cement (ANSI/ASTM D1785) except where ULC S636 compliance is required. For ULC S636 compliance, all pipe, fittings and cement must be IPEX System 636. When using IPEX kits, use only IPEX product code 196006 for 3" venting or IPEX product code 196021 for 4" venting. Contact Weil-McLain for ordering information and availability of Weil-McLain venting kits.

Items required (DV=Direct Vent; DE=Direct Exhaust)	W-M P/N	QTY	✓
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Sidewall with Well-McLain Plate			
• W-M sidewall term. kit	3" 383-500-397 4" 383-500-398	1	✓

Includes W-M sidewall vent/air termination cap and inside/outside cover plates and mounting hardware; openings are sized for PVC pipe.
 3" cap is shipped with Ultra-80-155.
 4" cap is shipped with Ultra-230-399.

Sidewall DV with separate pipes or DE (elbow)			
Inside and outside cover plates and mounting hardware supplied with boiler can be used at wall penetrations if size is the same as the pipe used. (Cut plates to size for direct exhaust applications.)			<input type="checkbox"/>

• Bird screens (for 2" pipe, trim 3" bird screen to size)	3" 383-500-105 4" 383-500-110	1 DE 2 DV	<input type="checkbox"/>
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Vertical DV with separate pipes or DE (coupling)			
• Bird screens (for 2" pipe, trim 3" bird screen to size)	3" 383-500-105 4" 383-500-110	1 DE 2 DV	<input type="checkbox"/>
• Coupling (1)		Add to the table at right	
• 180-degree return bend (1) (DV only)		Add to the table at right	

3" or 4" PVC concentric termination, sidewall or vertical			
• Standard C.T. kit, 3"	383-500-350	1	<input type="checkbox"/>
• S636 compliant C.T. kit, 3"	Consult factory		
• S636 compliant C.T. kit, 4"	Consult factory		
• Reducers: 3"x2" <input type="checkbox"/> 4"x3" <input type="checkbox"/>		Add to the table at right	

NOTE: Also obtain all required flashings, boots, thimbles, fire stops or other items required for wall, ceiling and roof penetrations.

Fold out the opposite page to see venting details.

Residential Gas Boilers

EG Water or Steam, Natural Draft, NATL or LP, MBH: 75-300, Avg. Eff.: 83%
 CGa Water, Natural Draft, NATL or LP, MBH: 92-245, Avg. Efficiency: 83%
 S60 Steam with Tankless Heater Option, MBH: 114-295, Avg. Efficiency: 84%
 WGO Water without Tankless Heater, MBH: 96-295, Avg. Efficiency: 80%
 GV Water, Sealed Combustion, NATL or LP, MBH: 70-175, Avg. Efficiency: 87%
 ULTRA GAS Water, Sealed Combustion, NATL or LP, MBH: 80-300, Avg. Efficiency: 90%
 CGs Water, Sealed Combustion, NATL or LP, MBH: 87-107, Avg. Efficiency: 84%

Residential Oil Boilers

WTGO Water with Tankless Heater, MBH: 115-295, Avg. Efficiency: 80%
 WGO Water without Tankless Heater, MBH: 96-295, Avg. Efficiency: 80%

Accessories

System Controls and Zone Controllers
 Finned-Tube and Cast Iron Baseboard
 WMBP, WMB Braised Plate Heat Exchangers
 Maxi-Flo Pool Heaters

Indirect-Fired Water Heaters

PLUS 100, 110, 119
 GOLD Plus 30, 40, 60, 80
 ULTRA Plus 40, 50, 80

Commercial Boilers

Ultra 550 & 750 Gas Water, MBH: 550-750, Combustion Eff.: 93%
 88 Gas, Oil & Gas/Oil Water or Steam, MBH: 998-5845, Combustion Eff.: 85.7%
 94 Gas, Oil & Gas/Oil Water or Steam, MBH: 2,540-5,800, Combustion Eff.: 84%
 EGH Gas Water or Steam, MBH: 340-950, Combustion Eff.: 80%
 PFG Gas Water, MBH: 244-427, Combustion Eff.: 81%
 LGB Gas Water or Steam, MBH: 400-2,800, Combustion Eff.: 81%
 80 Gas, Oil & Gas/Oil Water or Steam, MBH: 340-500, Combustion Eff.: 80%

Other Quality Products from Weil-McLain
 www.weil-mclain.com
 C-1120 (0910)

Ultra

Gas-fired water boilers – Series 3

Featuring *Ucontrol* Flexibility

QUICK-START GUIDE

Installation guide and material checklists

Ultra Series 3

WARNING This guide must only be used by a qualified heating installer/service technician. Read all instructions, including the boiler manual and all other information shipped with the boiler, before installing. Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage.

Material checklist — piping and other items

JOB NAME	
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ITEMS	✓
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Boiler loop piping and components										
NOTICE — The piping must be installed as primary/secondary, with the boiler on its own loop as shown in the Ultra boiler manual and in this guide. (This requirement is met when using optional Easy-Up Manifolds.) Use the pipe sizes listed below.										
Pipe, valves and fittings: (including flow/check valve)	<table border="1"> <tr> <td>Ultra-80, 105</td> <td>1" or larger</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Ultra-155, 230</td> <td>1¼" or larger</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Ultra-299, 399</td> <td>1½" or larger</td> <td><input type="checkbox"/></td> </tr> </table>	Ultra-80, 105	1" or larger	<input type="checkbox"/>	Ultra-155, 230	1¼" or larger	<input type="checkbox"/>	Ultra-299, 399	1½" or larger	<input type="checkbox"/>
Ultra-80, 105	1" or larger	<input type="checkbox"/>								
Ultra-155, 230	1¼" or larger	<input type="checkbox"/>								
Ultra-299, 399	1½" or larger	<input type="checkbox"/>								
Optional Ultra Easy-Up Manifolds (complete, pre-assembled boiler loop piping; circulator shipped loose with boiler) — 1¼" for Ultra-80/-105; 1½" for -155 to -399	<table border="1"> <tr> <td>Part numbers: 1¼" (383-500-649) 1½" (383-500-661)</td> <td><input type="checkbox"/></td> </tr> </table>	Part numbers: 1¼" (383-500-649) 1½" (383-500-661)	<input type="checkbox"/>							
Part numbers: 1¼" (383-500-649) 1½" (383-500-661)	<input type="checkbox"/>									

Electrical components	
Wiring materials and fused shut-off switch	<input type="checkbox"/>
Zone valves and other system control devices, as required	<input type="checkbox"/>
Carbon monoxide detector, when required	<input type="checkbox"/>

Antifreeze, when required	
Use only antifreeze listed in Ultra boiler manual as suitable for use with Ultra Gas boilers (antifreeze is available from Weil-McLain) — Ask your Weil-McLain distributor for information or visit us online at www.weil-mclain.com to review Ultra literature for recommendations.	<input type="checkbox"/>

System and zone piping	
System circulator and zone circulators (or zone valves)	<input type="checkbox"/>
Pipe, valves and fittings for system and zone piping	<input type="checkbox"/>
Air separator and expansion tank	<input type="checkbox"/>
Fresh water make-up piping and components	<input type="checkbox"/>

Ventilation openings	
Louvers for ventilation openings, when specified in boiler manual	<input type="checkbox"/>

Propane applications	
Ultra-80 can be ordered as propane or you can obtain the Ultra-80 propane conversion kit. For Ultra-80 at altitude up to 5,500 feet, use W-M p/n 383-501-020. All other Ultra boilers are shipped with items needed to set up the boiler for propane, for altitude up to 5,500 feet.	<input type="checkbox"/>

High altitude propane, Ultra-80 only	
For altitude above 5,500 feet, all Ultra boilers require a high-altitude propane conversion kit. The Ultra-80 must first be equipped for propane (either purchased as Ultra-80LP or converted to Ultra-80LP using the kit listed above). Ultra-80LP 383-500-644	<input type="checkbox"/>

High altitude propane, Ultra-105-399	
For altitude above 5,500 feet, all Ultra boilers (except Ultra-399) require a high-altitude propane conversion kit. Obtain the kit listed below:	<input type="checkbox"/>
Ultra-105	383-500-645
Ultra-155	383-500-646
Ultra-230	383-500-647
Ultra-299	383-500-648

Condensate line	
Pipe or tubing for condensate line — ½" PVC or CPVC pipe; or 5/8" I.D. tubing	<input type="checkbox"/>
Condensate neutralizing kit when required. Weil-McLain part number 383-500-631	<input type="checkbox"/>
Condensate pump (required when condensate cannot drain by gravity to an appropriate location)	<input type="checkbox"/>

Water treatment	
Sentinel X100 inhibitor is shipped with each boiler and must be applied as directed in the boiler manual.	<input type="checkbox"/>
Water treatment company must provide additional system water treatment if required.	<input type="checkbox"/>

Wall mounting option	
Weil-McLain Ultra wall-mounting kit, p/n 389-900-180	<input type="checkbox"/>

Recommended equipment	
Use a combustion analyzer to verify boiler operation, following the instructions in the Ultra boiler manual.	<input type="checkbox"/>
U-tube manometer for checking gas line pressure	<input type="checkbox"/>
Volt-ohmmeter may be required for troubleshooting	<input type="checkbox"/>

Fold out the opposite page to see piping details.

VENT & AIR PIPING

(see boiler manual for details)

3



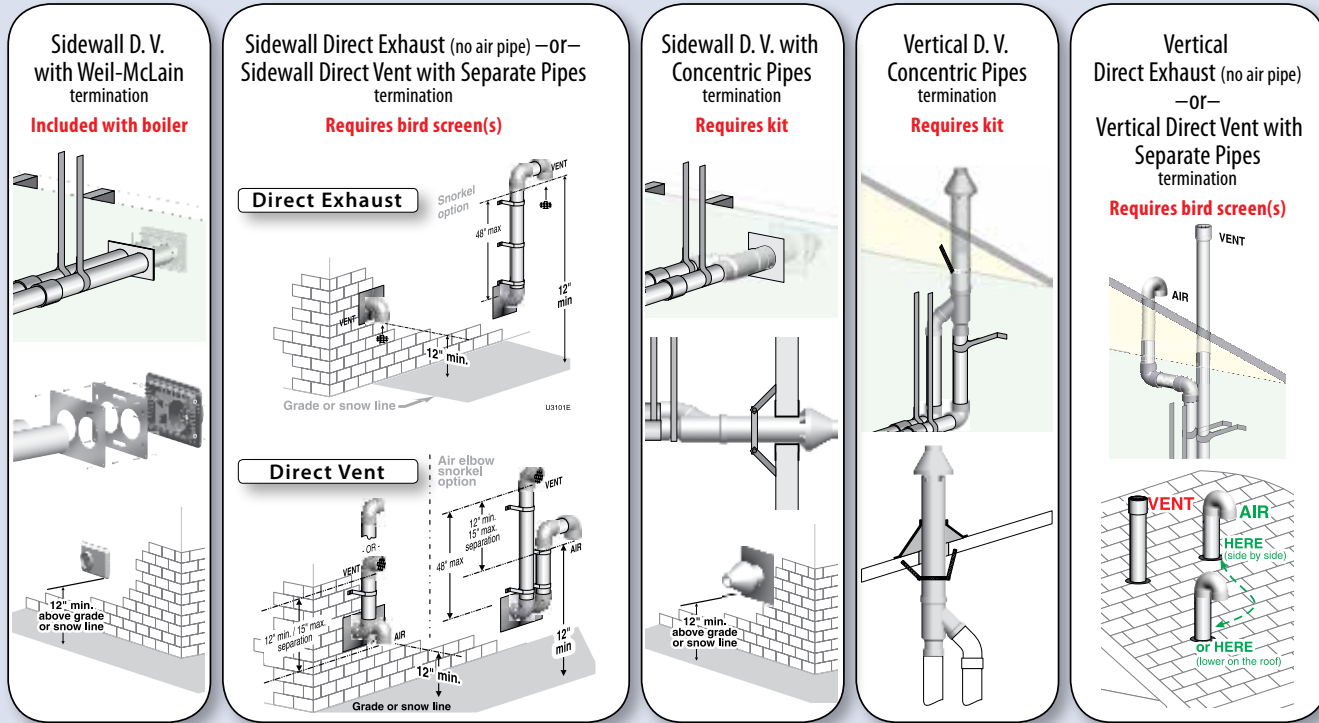
Slide the air inlet pipe and vent pipe into the boiler top openings. Just tighten the restraining rings — no messy sealants required. Reducers or adapters are required when the vent / air pipe O. D. is different from the boiler connection diameter (see below). All AL29-4C stainless pipe applications require adapters made by the vent pipe manufacturer. See the material checklist for items required.

Ultra boilers can be sidewall vented or vertically vented as shown in the five options below and in the manual. Choose either direct vent (D.V. — requires air pipe for combustion air) or direct exhaust (D.E. — uses inside air) as shown.

Make sure the terminations are placed as required in the manual and that air intakes are at least 12 inches above normal snow line.

Vent / air pipe size options (PVC sizes):

- Ultra-80, 105: 2" or 3"
- Ultra-155: 3"
- Ultra-230: 3" or 4"
- Ultra-299, 399: 4"



Ultra QUICK-START

(Follow all instructions in Boiler manual)

START-UP, ADJUST & TEST

- Follow the boiler manual instructions to clean the system if needed, then fill and check water chemistry.
- Start up the boiler as directed in the manual. Use a combustion analyzer where specified.



- Choose pre-loaded boiler settings, or customize settings for various applications.

WIRE THE BOILER

- Connect power wiring and control wiring per boiler manual wiring diagram.
- Connect system and DHW circulator wiring to the terminals designated in the boiler manual.

INSTALL GAS PIPING

- Install a union and shutoff valve.
- No external drip leg is needed — it is already included in the boiler's internal gas piping.

INSTALL CONDENSATE PIPING / TUBING AND COMPONENTS

- Fill out the material checklist in this guide to ensure you have the tubing or PVC pipe and all components you will need for the condensate piping.
- Connection tee and internal components are supplied with the boiler.

BEFORE INSTALLING . . .

- Make sure there is enough clearance for the boiler and all water, gas and air piping. Verify vent/air termination can be located as required.
- All models are shipped with the items needed for propane conversion except the Ultra-80, which requires a separate conversion kit (see material checklist).
- When wall mounting the boiler, obtain the wall-mount kit (see material checklist).

Steps 2 – 6 can be done in any order — just make sure that air, vent, water and gas pipes will not interfere with one another.

INSTALL WATER PIPING

- See information at right.
- Refer to the material checklist in this guide for a list of items needed.

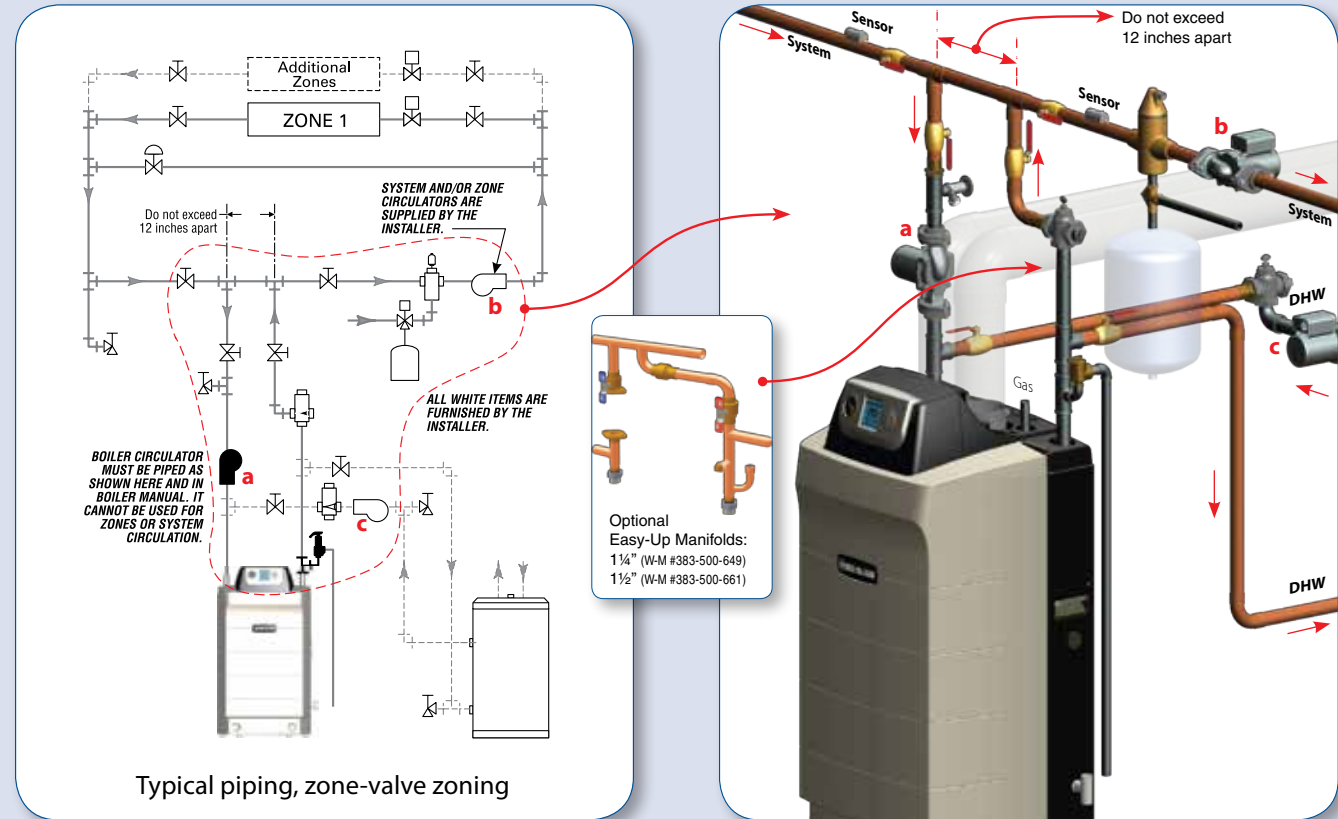
INSTALL VENT & AIR PIPING

- See vent / air piping options at left.
- Refer to the material checklist in this guide for a list of items needed.

2

WATER PIPING

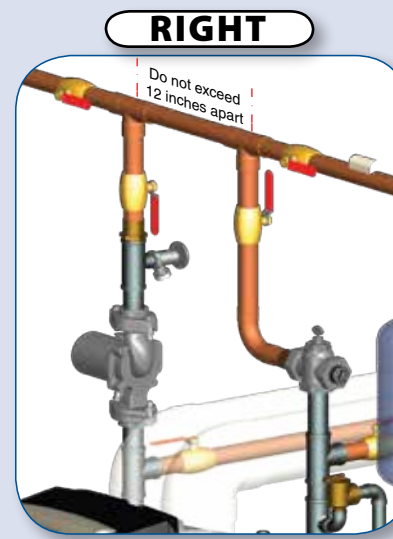
(see boiler manual for details)



The circulator supplied with the boiler (a) must be used only in the boiler secondary loop as shown in the schematic above and in the manual. System (b) and zone circulators and DHW circulator (c) must be supplied by the installer. Above right is a typical installation, showing the near-boiler piping and connection to the system.

Boiler loop piping must be sized to the minimums listed in the boiler manual. Using smaller piping will cause performance problems.

- Ultra-80 / Ultra-105 use 1" or larger
- Ultra-155 / Ultra-230 use 1 1/4" or larger
- Ultra-299 / Ultra-399 use 1 1/2" or larger



INSTALLING THE PRIMARY/SECONDARY TEES

The near-boiler piping must be primary/secondary as shown above and left, with the boiler loop piping entering the tees in the branch connection.

DO NOT connect boiler piping to the tee through connections as shown at right. The system will not work correctly this way.

