



Ultra

Gas-fired water boilers – Series 3

Featuring

*U*Control

Flexibility

QUICK-START GUIDE

Installation guide and material checklists



Ultra
Series 3

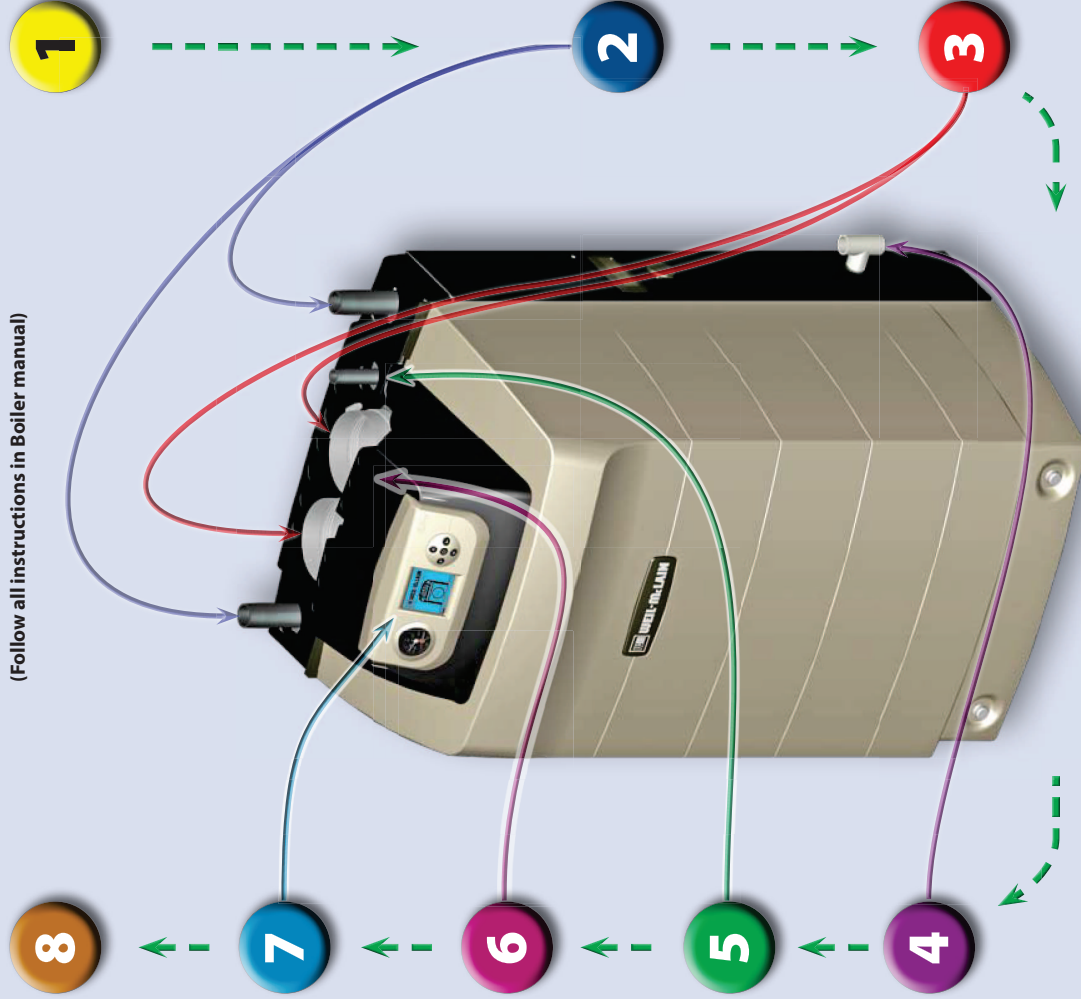


WARNING

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.

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.

Ucontrol

- 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.

1

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.

2

INSTALL WATER PIPING

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

[CLICK HERE](#)

3

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.

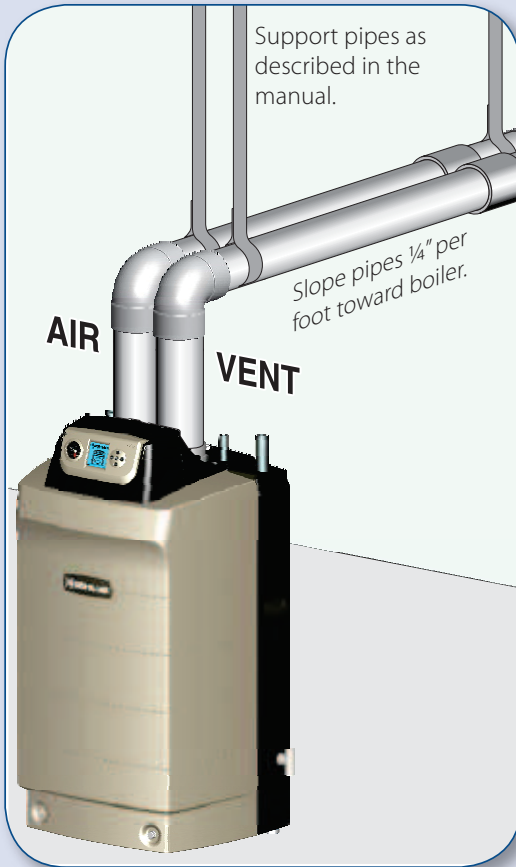
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VENT & AIR PIPING

3

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(see boiler manual for details)



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"



TRIM OFF HERE

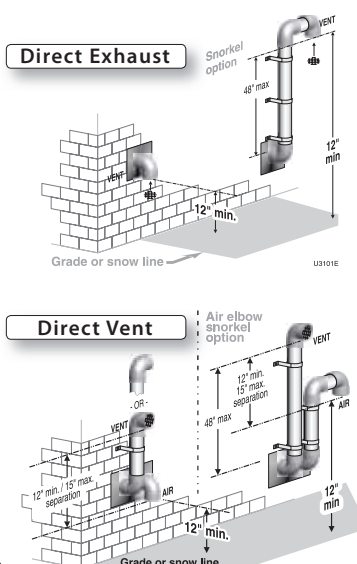
Sidewall D. V.
with Weil-McLain
termination

Included with boiler



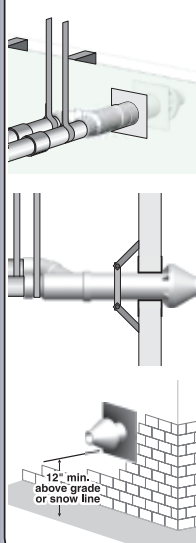
Sidewall Direct Exhaust (no air pipe) —OR—
Sidewall Direct Vent with Separate Pipes
termination

Requires bird screen(s)



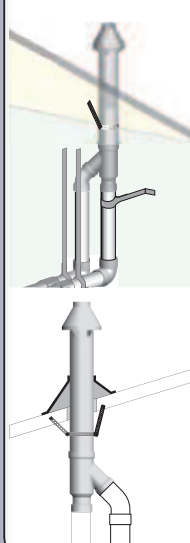
Sidewall D. V. with
Concentric Pipes
termination

Requires kit



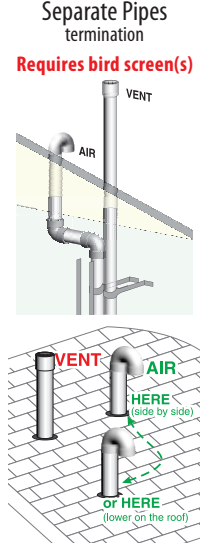
Vertical D. V.
Concentric Pipes
termination

Requires kit



Vertical
Direct Exhaust (no air pipe)
—OR—
Vertical Direct Vent with
Separate Pipes
termination

Requires bird screen(s)



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	ANSI/ASTM	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	ANSI/ASTM	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	
AL29-4C piping materials				
Vent pipe	Heat Fab, Inc. Saf-T-Vent® Z-Flex, Inc. Z-Vent II Simpson Dura-Vent FasNSeal™	Certified for Category IV and direct vent appliance venting		
Note 1:	DO NOT use DWV, CPVC or ABS when using concentric vent termination. Use ONLY PVC schedule 40.			
Note 2:	IPEX PVC concentric terminations utilize PVC pipe/fittings certified to ULC S636. Where ULC S636 compliance is required, use only IPEX System 636 pipe, fittings and cement.			
WARNING	AL29-4C vent piping — Install a PVC-to-stainless adapter supplied by the vent pipe manufacturer at the boiler vent connection and at the termination (when using Weil-McLain plate or concentric PVC termination). DO NOT mix piping from different vent pipe manufacturers unless using adapters specifically designed for the purpose by the manufacturer. Plastic piping — Do not attempt to connect different types of plastic piping together. DO NOT use cellular core pipe. All vent and air pipes require a bird screen at each termination where specified in the manual or vent supplement.			

Items required (DV=Direct Vent; DE=Direct Exhaust)	W-M P/N	QTY	✓
Sidewall with Weil-McLain Plate			
• W-M sidewall term. kit	3" 4"	383-500-397 383-500-398	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.			Included with boiler
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" 4"	383-500-105 383-500-110	1 DE 2 DV
Vertical DV with separate pipes or DE (coupling)			
• Bird screens (For 2" pipe, trim 3" bird screen to size)	3" 4"	383-500-105 383-500-110	1 DE 2 DV
• 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" • S636 compliant C. T. kit, 3" S636 compliant C. T. kit, 4"	383-500-350 Consult factory Consult factory		1
• 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.

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 Weil-McLain Vent/air cap		Sidewall Direct Vent with Separate Pipes — or — Sidewall or Vertical Direct Exhaust		Sidewall or Vertical Direct Vent 3" PVC Concentric (Use only PVC pipe DO NOT use CPVC or ABS) [Note 1]		Sidewall or Vertical Direct Vent 4" PVC Concentric (Use only PVC pipe DO NOT use CPVC or ABS) [Note 1]		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
	3"	100	2	100	2	100	1	NA		100	1
155	3"	100	2	100	2	100	1	NA		100	1
	4"	30 (c)	2	30 (c)	2	30 (c)	1	30 (c)	1	30 (c)	1
230	3"	100 (d)	2	100	2	70 (d)	1	70 (d)	1	100	1
	4"	100	2	100	2	70 (d)	1	100	1	100	1
299	3"	100	2	100	2	70 (d)	1	100	1	100	1
	4"	100	2	100	2	NA		100	1	100	1
399	3"	100	2	100	2	NA		100	1	100	1
	4"	100	2	100	2	NA		100	1	100	1
Equivalent feet for elbows — deduct from maximum equivalent length of piping: • 7 feet per for 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.											

Pipe and fittings — PLASTIC			
Material —	PVC <input type="checkbox"/>	CPVC <input type="checkbox"/>	ABS <input type="checkbox"/>
Size —	2" <input type="checkbox"/>	3" <input type="checkbox"/>	4" <input type="checkbox"/>
ITEM	QTY		✓
Straight pipe	feet		<input type="checkbox"/>
Elbows, 90-degree (include termination elbows if required)			<input type="checkbox"/>
Couplings (include termination if vertical separate pipes)			<input type="checkbox"/>
Return bend, 180-degree (vertical separate-pipe termination)	1		<input type="checkbox"/>
Reducers: 3"x2" <input type="checkbox"/> 4"x3" <input type="checkbox"/>			<input type="checkbox"/>

Pipe and fittings — AL29-4C Stainless			
Product —	Saf-T-Vent® <input type="checkbox"/>	Z-Vent II <input type="checkbox"/>	FasNSeal™ <input type="checkbox"/>
Size —	2" <input type="checkbox"/>	3" <input type="checkbox"/>	4" <input type="checkbox"/>
ITEM	QTY		✓
Straight pipe	feet		<input type="checkbox"/>
Adjustable lengths			<input type="checkbox"/>
Elbows, 90-degree			<input type="checkbox"/>
Termination elbows (with integral screen), when req'd			<input type="checkbox"/>
Elbows, 45-degree			<input type="checkbox"/>
Adapter at boiler (to fit diameter of boiler connection)			<input type="checkbox"/>
Adapter at termination, if required			<input type="checkbox"/>

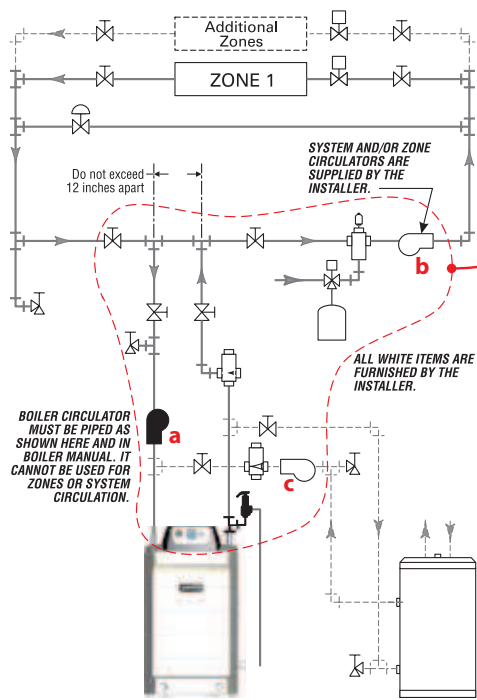
Fold out the opposite page to see venting details.

RETURN TO VENT AND AIR PIPING

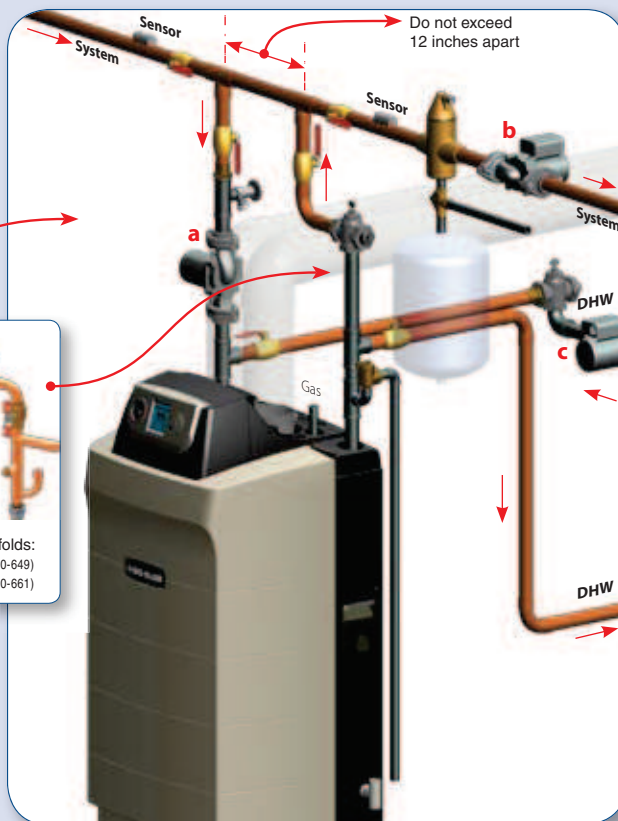
WATER PIPING

(see boiler manual for details)

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Typical piping, zone-valve zoning

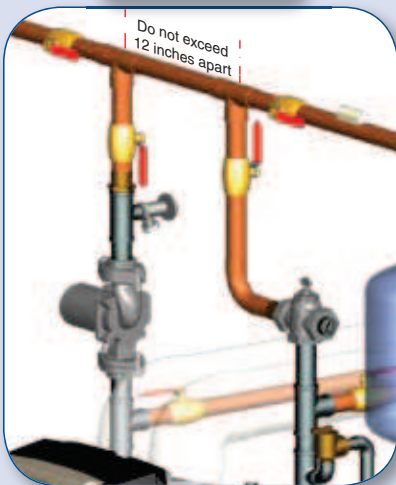


The circulator supplied with the boiler (a) must be used only in the boiler secondary loop as shown in the schematic above and in the manual. System (b) and zone circulators and DHW circulator (c) must be supplied by the installer. Above right is a typical installation, showing the near-boiler piping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

RIGHT

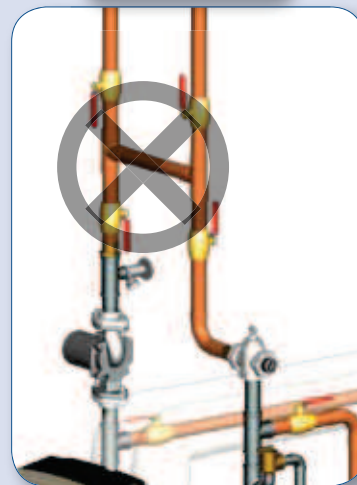


INSTALLING THE PRIMARY/SECONDARY TEES

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.

WRONG



Material checklist — piping and other items

JOB NAME	
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)	<div style="display: flex; justify-content: space-between;"> <div> Ultra-80, 105 Ultra-155, 230 Ultra-299, 399 </div> <div> 1" or larger 1¼" or larger 1½" or larger </div> <div style="text-align: center;"> <input type="checkbox"/> </div> </div>
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	<div style="display: flex; justify-content: space-between;"> <div> Part numbers: 1¼" (383-500-649) 1½" (383-500-661) </div> <div style="text-align: center;"> <input type="checkbox"/> </div> </div>
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"/>
DHW piping	
DHW circulator	<input type="checkbox"/>
Pipe, valves and fittings (including flow/check valve)	<input type="checkbox"/>
Other piping	
Gas piping, valves and fittings; ground-joint union and manual shut-off valve for boiler gas connection; gas pressure regulator, if required	<input type="checkbox"/>
¾" pipe and elbows for relief valve discharge piping	<input type="checkbox"/>
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"/>
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"/>
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). <div style="display: flex; justify-content: space-between;"> Ultra-80LP 383-500-644 </div>	<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: <div style="display: flex; justify-content: space-between;"> Ultra-105 383-500-645 </div> <div style="display: flex; justify-content: space-between;"> Ultra-155 383-500-646 </div> <div style="display: flex; justify-content: space-between;"> Ultra-230 383-500-647 </div> <div style="display: flex; justify-content: space-between;"> Ultra-299 383-500-648 </div>	<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"/>