WEIL-McLAIN

Ultra

Gas-fired water boilers – Series 3

Featuring UControl *Flexibility*

QUICK-START GUIDE

Installation guide and material checklists

⚠WARNING This guide must only be used by a quali!ed 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)

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.

CLICK HERE

4 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.

5 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.

6 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.

7 UControl

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

8 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.

MATERIAL CHECKLIST

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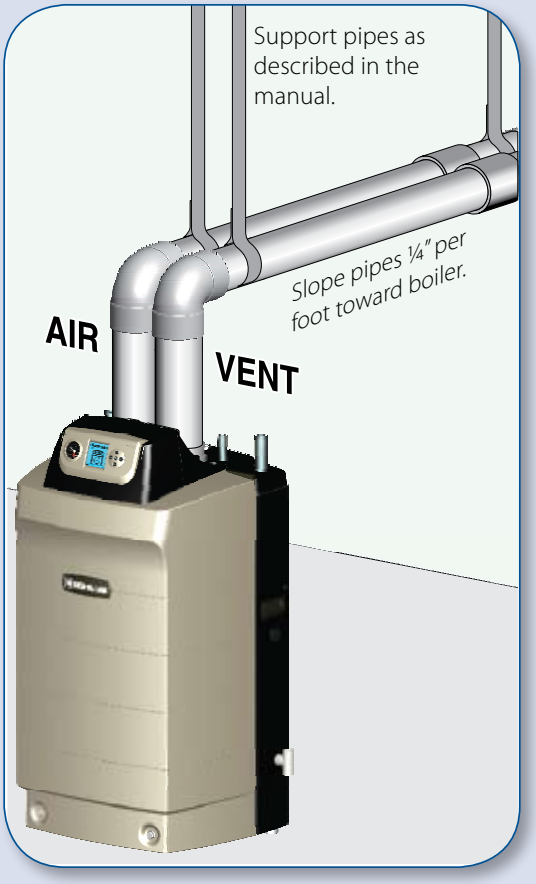
VENT & AIR PIPING

(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.

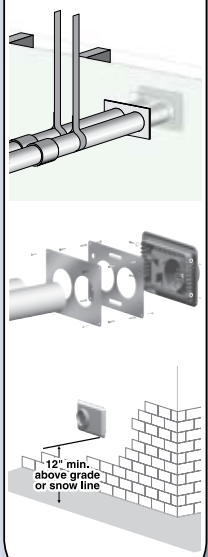
Make sure the terminations are placed as required in the manual and that air intakes are at least 12 inches above normal snow line.

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"

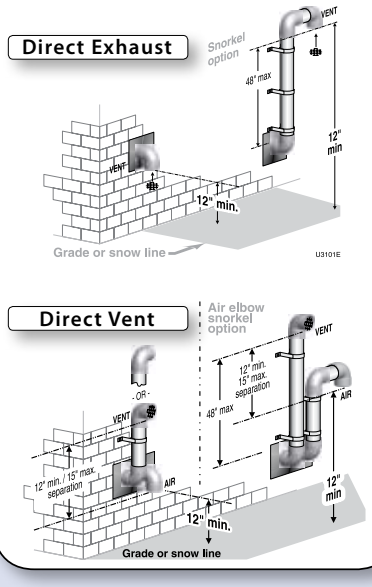
Sidewall D. V. with Weil-McLain termination

Included with boiler



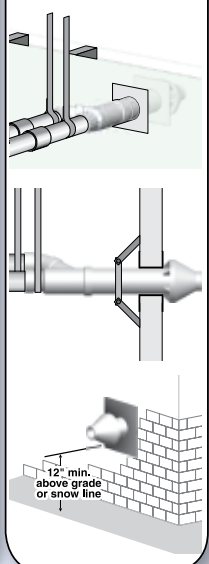
Sidewall Direct Exhaust (no air pipe) –or– Sidewall Direct Vent with Separate Pipes termination

Requires bird screen(s)



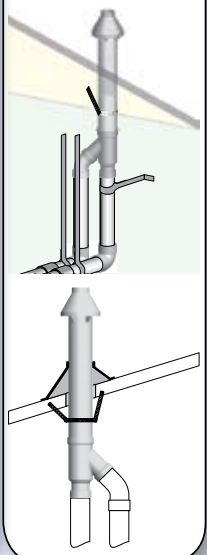
Sidewall D. V. with Concentric Pipes termination

Requires kit



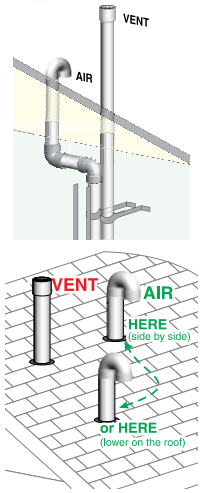
Vertical D. V. Concentric Pipes termination

Requires kit



Vertical Direct Exhaust (no air pipe) –or– Vertical Direct Vent with Separate Pipes termination

Requires bird screen(s)



TRIM OFF HERE

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) Air pipe can be any of those listed at left if acceptable for local codes.
	PVC-DWV (Note 1)	D2665	
	CPVC sch 40 (Note 1)	F441	
	ABS-DWV sch 40 (Note 1)	D2661	
Cement	PVC	D2564	
	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	Included with boiler
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.)				☐
• 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" ☐ 4"x3" ☐		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.

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.)

Ultra model	Vent or air pipe size	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
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 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 ☐ CPVC ☐ ABS ☐
Size — 2" ☐ 3" ☐ 4" ☐

ITEM	QTY	✔
Straight pipe	feet	☐
Elbows, 90-degree (include termination elbows if required)		☐
Couplings (include termination if vertical separate pipes)		☐
Return bend, 180-degree (vertical separate-pipe termination)	1	☐
Reducers: 3"x2" ☐ 4"x3" ☐		☐

Pipe and fittings — AL29-4C Stainless

Product — Saf-T-Vent® ☐ Z-Vent II ☐ FasNSeal™ ☐
Size — 2" ☐ 3" ☐ 4" ☐

ITEM	QTY	✔
Straight pipe	feet	☐
Adjustable lengths		☐
Elbows, 90-degree		☐
Termination elbows (with integral screen), when req'd		☐
Elbows, 45-degree		☐
Adapter at boiler (to fit diameter of boiler connection)		☐
Adapter at termination, if required		☐

RETURN TO VENT AND AIR PIPING

2 WATER PIPING

(see boiler manual for details)

MATERIAL CHECKLIST

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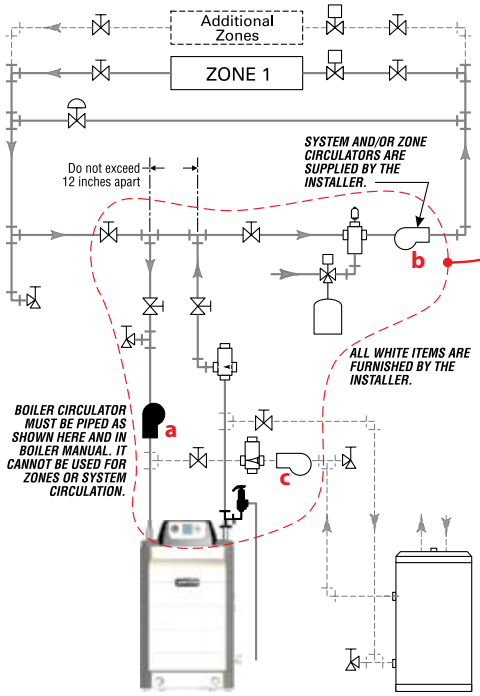
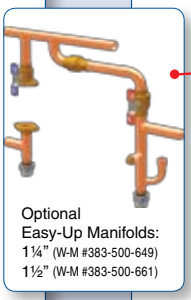
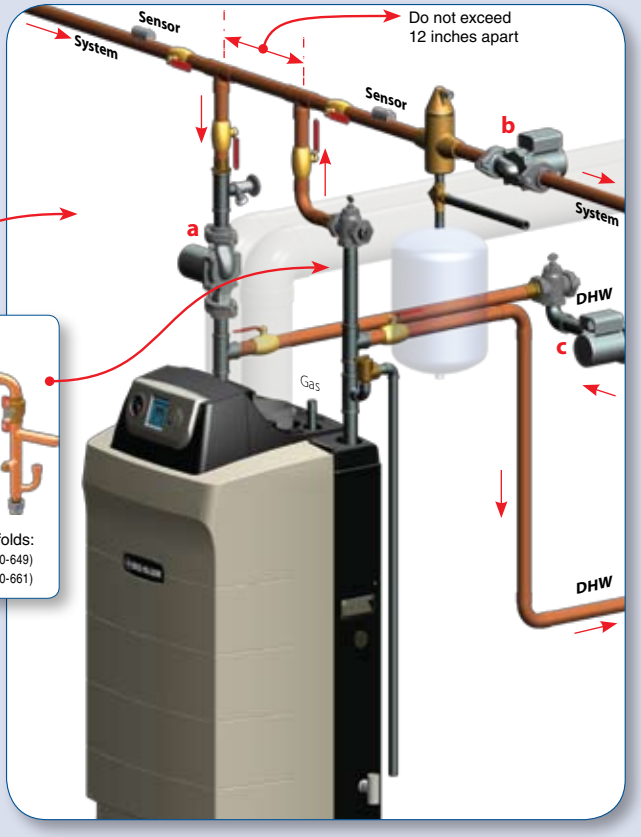


Typical piping, zone-valve zoning



Optional
Easy-Up Manifolds:
1¼" (W-M #383-500-649)
1½" (W-M #383-500-661)

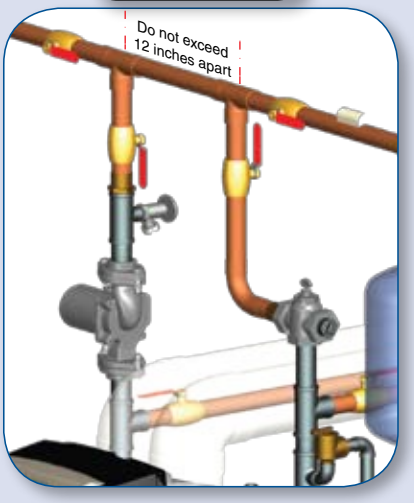


The circulator supplied with the boiler (**a**) must be used only in the boiler secondary loop as shown in the schematic above and in the manual. System (**b**) and zone circulators and DHW circulator (**c**) must be supplied by the installer. Above right is a typical installation, showing the near-boiler 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 1¼" or larger
- Ultra-299 / Ultra-399 . . . . . use 1½" or larger

RIGHT

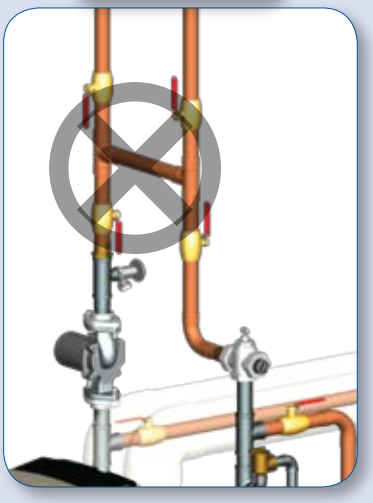


INSTALLING THE PRIMARY/SECONDARY TEES

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



Ultra QUICK-START 2 4 5 6 8

Material checklist — piping and other items

JOB NAME		

ITEMS			✔
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)	**Ultra-80, 105** **Ultra-155, 230** **Ultra-299, 399**	**1" or larger** **1¼" or larger** **1½ or larger**	☐
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		**Part numbers:** **1¼" (383-500-649)** **1½" (383-500-661)**	☐
System and zone piping			
System circulator and zone circulators (or zone valves)			☐
Pipe, valves and fittings for system and zone piping			☐
Air separator and expansion tank			☐
Fresh water make-up piping and components			☐
DHW piping			
DHW circulator			☐
Pipe, valves and fittings (including flow/check valve)			☐
Other piping			
Gas piping, valves and fittings; ground-joint union and manual shut-off valve for boiler gas connection; gas pressure regulator, if required			☐
¾" pipe and elbows for relief valve discharge piping			☐
Condensate line			
Pipe or tubing for condensate line — ½" PVC or CPVC pipe; or 5/8" I.D. tubing			☐
Condensate neutralizing kit when required Weil-McLain part number 383-500-631			☐
Condensate pump (required when condensate cannot drain by gravity to an appropriate location)			☐
Water treatment			
Sentinel X100 inhibitor is shipped with each boiler and must be applied as directed in the boiler manual.			
Water treatment company must provide additional system water treatment if required.			☐

ITEMS	✔
Electrical components	
Wiring materials and fused shut-off switch	☐
Zone valves and other system control devices, as required	☐
Carbon monoxide detector, when required	☐
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.	☐
Ventilation openings	
Louvers for ventilation openings, when specified in boiler manual	☐
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.	☐
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	☐
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: Ultra-105 383-500-645 Ultra-155 383-500-646 Ultra-230 383-500-647 Ultra-299 383-500-648	☐
Wall mounting option	
Weil-McLain Ultra wall-mounting kit, p/n 389-900-180	☐
Recommended equipment	
Use a **combustion analyzer** to verify boiler operation, following the instructions in the Ultra boiler manual.	☐
U-tube manometer for checking gas line pressure	☐
Volt-ohmmeter may be required for troubleshooting	☐

RETURN TO WATER PIPING

Fold out the opposite page to see piping details.

Residential Gas Boilers

EG
Water or Steam, Natural Draft
NAT'L or LP
MBH: 75-300
Avg. Eff.: 83%

GV
Water, Sealed Combustion
NAT'L or LP
MBH: 70-175
Avg. Efficiency: 87%

ULTRA GAS
Water, Sealed Combustion
NAT'L or LP
MBH: 80-300
Avg. Efficiency: 95%

CGs
Water, Sealed Combustion
NAT'L or LP
MBH: 67-167
Avg. Efficiency: 84%

CGt
Water with Tankless Heater
Induced Draft
NAT'L or LP
MBH: 133
Efficiency: 81%

CGI
Water, Induced Draft
NAT'L or LP
MBH: 50-233
Avg. Efficiency: 83.5%

CGa
Water, Natural Draft
NAT'L or LP
MBH: 52-245
Avg. Efficiency: 83%

Residential Oil Boilers

SGO
Steam with Tankless Heater Option
MBH: 114-285
Avg. Efficiency: 84%

ULTRA OIL
Water, Chimney and Direct Vent
MBH: 98-172
Avg. Efficiency: 86%

WGO
Water without Tankless Heater
MBH: 86-285
Avg. Efficiency: 85%

WTGO
Water with Tankless Heater
MBH: 110-285
Avg. Efficiency: 85%

Accessories

System Controls and Zone Controllers

Finned-Tube and Cast Iron Baseboard

WMBP, WMB
Brazed Plate Heat Exchangers
Forced Air Heat Exchangers

Maxi-Flo® Pool Heaters

Indirect-Fired Water Heaters

PLUS
100, 110, 119

GOLD Plus
30, 40, 60, 80

ULTRA Plus
40, 60, 80

Commercial Boilers

Ultra 550 & 750
Gas
Water
MBH: 550-750
Combustion Eff.: 83+%

EGH
Gas
Water or Steam
MBH: 349-550
Combustion Eff.: 80%

PFG
Gas
Water
MBH: 244-427
Combustion Eff.: 81%

LGB
Gas
Water or Steam
MBH: 400-2,880
Combustion Eff.: 81%

88
Gas, Oil & Gas/Oil
Water or Steam
MBH: 990-5,043
Combustion Eff.: 85.7%

94
Gas, Oil & Gas/Oil
Water or Steam
MBH: 2,540-9,660
Combustion Eff.: 84%

80
Gas, Oil & Gas/Oil
Water or Steam
MBH: 346-1,674
Combustion Eff.: 85%

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C-1120 (0910)