

☆ IMPORTANT INFORMATION ☆ KEEP FOR OPERATOR ☆ IMPORTANT INFORMATION ☆

## OPERATOR MANUAL

Part Number 121008 Rev. C

## OM-FT

DOMESTIC

**MODELS: FT, MW/FT, PT (b Jacketed)  
GT, MW/GT, GPT (Full Jacketed)  
Steam Jacketed Kettles**

*Stainless Steel  
Direct steam heated  
Stationary*



Model FT



Model GPT

**THIS MANUAL MUST BE RETAINED FOR FUTURE REFERENCE.  
READ, UNDERSTAND AND FOLLOW THE INSTRUCTIONS AND  
WARNINGS CONTAINED IN THIS MANUAL.**

**WARNING**  
**DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE  
VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER  
APPLIANCE.**



Packaging - Processing  
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## IMPORTANT — READ FIRST — IMPORTANT

- CAUTION:** BE SURE ALL OPERATORS READ, UNDERSTAND AND FOLLOW THE OPERATING INSTRUCTIONS, CAUTIONS, AND SAFETY INSTRUCTIONS CONTAINED IN THIS MANUAL.
- WARNING:** THIS UNIT IS INTENDED FOR USE IN THE COMMERCIAL HEATING, COOKING AND HOLDING OF WATER AND FOOD PRODUCTS, PER THE INSTRUCTIONS CONTAINED IN THIS MANUAL. ANY OTHER USE COULD RESULT IN SERIOUS PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT AND WILL VOID WARRANTY.
- WARNING:** KETTLES MUST BE INSTALLED BY PERSONNEL QUALIFIED TO WORK WITH PLUMBING. IMPROPER INSTALLATION CAN RESULT IN INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.
- WARNING:** AVOID ANY EXPOSURE TO ESCAPING STEAM. STEAM CAN CAUSE SEVERE BURNS.
- WARNING:** AVOID ALL DIRECT CONTACT WITH HOT EQUIPMENT SURFACES. DIRECT SKIN CONTACT COULD RESULT IN SEVERE BURNS.
- WARNING:** AVOID ALL DIRECT CONTACT WITH HOT FOOD OR WATER IN KETTLES. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.
- CAUTION:** DO NOT OVER FILL THE KETTLE WHEN COOKING, HOLDING OR CLEANING. KEEP LIQUIDS A MINIMUM OF 2-3" (5-8 cm) BELOW THE KETTLE BODY RIM TO ALLOW CLEARANCE FOR STIRRING, BOILING AND SAFE PRODUCT TRANSFER.
- WARNING:** TAKE SPECIAL CARE TO AVOID CONTACT WITH HOT KETTLE BODY OR HOT PRODUCT WHEN ADDING INGREDIENTS, STIRRING OR TRANSFERRING PRODUCT TO ANOTHER CONTAINER.
- CAUTION:** KEEP FLOORS IN FRONT OF KETTLE WORK AREA CLEAN AND DRY. IF SPILLS OCCUR, CLEAN IMMEDIATELY, TO AVOID SLIPS OR FALLS.
- WARNING:** FAILURE TO CHECK SAFETY VALVE OPERATION PERIODICALLY COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO EQUIPMENT.
- WARNING:** WHEN TESTING, AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.
- CAUTION:** MOST CLEANERS ARE HARMFUL TO THE SKIN, EYES, MUCOUS MEMBRANES AND CLOTHING. PRECAUTIONS SHOULD BE TAKEN. WEAR RUBBER GLOVES, GOGGLES OR FACE SHIELD AND PROTECTIVE CLOTHING. CAREFULLY READ THE WARNINGS AND FOLLOW THE DIRECTIONS ON THE LABEL OF THE CLEANER TO BE USED.
- CAUTION:** USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR THEIR AUTHORIZED DISTRIBUTORS CAN CAUSE OPERATOR INJURY AND DAMAGE TO THE EQUIPMENT, AND WILL VOID ALL WARRANTIES.
- IMPORTANT:** SERVICE PERFORMED BY OTHER THAN FACTORY AUTHORIZED PERSONNEL WILL VOID WARRANTIES.

**Table of Contents**

IMPORTANT OPERATOR WARNINGS ..... 2

EQUIPMENT DESCRIPTION ..... 4

INSTALLATION ..... 6

INITIAL START-UP ..... 7

OPERATION ..... 8

SEQUENCE OF OPERATION ..... 8

CLEANING ..... 9

MAINTENANCE ..... 10

TROUBLESHOOTING ..... 11

PARTS LISTS ..... 12

PIPING DIAGRAM ..... 14

REFERENCES ..... 16

MAINTENANCE LOG ..... 17

WARRANTY ..... 19

## Equipment Description

### 1. General

The direct steam heated kettles covered in this manual are one-piece, welded constructions of 18.8 type 304 stainless steel, which are listed by the National Sanitation Foundation. They have bar rims with a continuous seal weld on the underside. The kettles are ASME shop inspected, and registered with the national board for operation at pressures up to 25 PSI. They are finished to 180 emery grit interior, and a bright semi-deluxe exterior. The table on Page 6 shows standard kettle sizes manufactured for each model since June, 1986.

Steam from a remote source passes directly into the jacket. Steam pressure forces condensate out through the condensate outlet. The units operate safely and efficiently at steam pressures from five to 25 PSI. A safety valve works to release any pressure above the 25 PSI limit. If required, higher jacket pressure (PSI) kettles can be provided. A globe valve is required on the steam inlet, and a strainer, steam trap and check valve are needed on the condensate outlet. Each of these may be ordered as an option (but are standard on wall-mounted units).

The kettles are emptied by tangent draw-offs. The standard draw-off on current models is a compression disk type, fabricated from 316 stainless steel with a 2 inch outer diameter (O.D.). The draw-off has a removable stainless steel strainer which has ¼ inch perforations. Options for the draw-off include a three-inch O.D., a strainer with ½ inch perforations, and a solid disk strainer.

2. **Models FT, MW/FT and PT** are deep kettles with **b** jackets. On units with capacities of 40 gallons or less, a one-piece hinged stainless steel dome cover is furnished. On larger units the cover is counter-balanced with a Model 51 spring-assisted actuator.
3. **Models GT, MW/GT and GPT** are fully jacketed. All sizes are equipped with domed covers which have counter-balanced actuators.

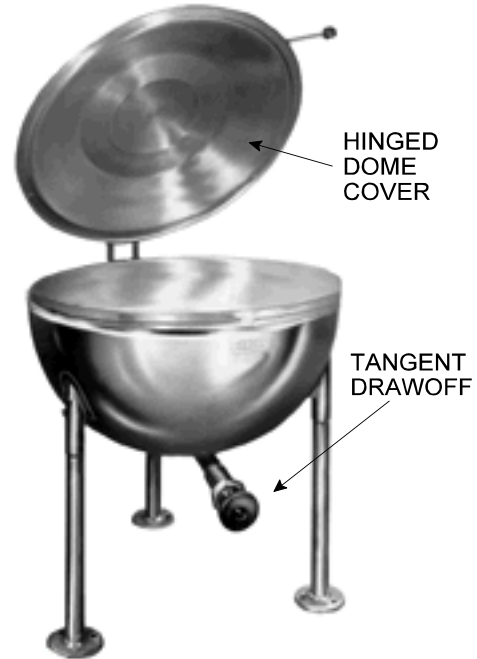


**Model PT**



**Model FT**

4. **Models FT and GT** stand on stainless steel, tubular legs, that are continuously welded to the kettle. The legs are fitted with adjustable stainless steel floor flanges.
5. **Models MW/FT and MW/GT** are supported by a structural steel framework which is suitable for wall mounting. This framework hangs on an in-wall carrier which may be purchased as an option. The frame is enclosed in a drip-proof, stainless steel housing. As assembled at the factory, the support structure includes steam inlet and condensate outlet piping and valves, a condensate strainer, trap, and a check valve. Optional piping and valves are available for jacket cooling water. Control valve stems protrude through the front of the support housing. The top and sides of the housing may be removed to provide access for service.
6. **Models PT and GPT** stand on a stainless steel pedestal base. The outer surface of the base is flanged down vertically to permit proper sealing to the floor or deck. These units are provided with a standard faucet bracket.
7. **Optional Equipment** may include:
  - a. Plug-type drawoff valves
  - b. Model FD close-coupled sanitary drain valves
  - c. TRI-BC cooking basket system
  - d. Fill faucet with swing spout
  - e. Gallon Master water meter
  - f. Kettle brush kit
  - g. Cover with No. 51 actuator (40-gallon kettle)
  - h. Steam trap assembly



**Model GT**



**Model GPT**



**MW/GT (Wall Mounted)**



**MW/FT (Wall Mounted)**

# OM-FT

## Standard Kettle Capacities, Gallons

Model	20	40	60	80	100	125	150
PT	•	•	•	•	•		
FT	•	•	•	•	•		
GT		•	•	•	•	•	•
GPT		•	•	•	•	•	•
MW/FT		•	•	•			

## Installation

**WARNING**

**THIS UNIT MUST BE INSTALLED BY PERSONNEL QUALIFIED TO WORK WITH PLUMBING. IMPROPER INSTALLATION CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.**

### A. All Models

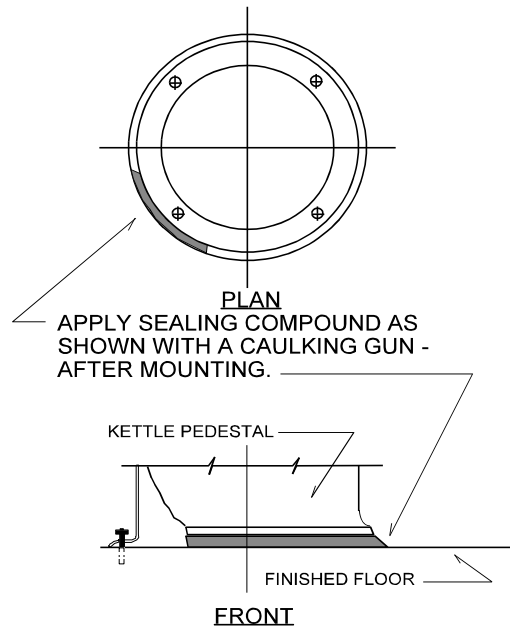
1. Installation under a ventilation hood is recommended.
2. If the steam supply pressure is greater than the maximum working pressure stamped on the nameplate, you **must** install a pressure reducing valve in the steam supply line near the kettle.
3. Connect the steam supply line to the steam inlet fitting. To obtain the full heating capability of the kettle, the steam supply line must be as large as the steam inlet fitting.
4. The safety valve is preset to relieve jacket pressure that exceeds its rated limit. Do **not** try to adjust the valve setting, and do **not** allow the valve outlet or lever to be blocked.
5. Connect the kettle condensate return line to the boiler return line, or to a drain. A suitable steam trap, strainer, and check valve must be installed. (See piping diagram, Page 14-15).
6. Any mechanical change must be approved by the Groen Food Service Engineering Department.

### B. Floor-Mounted Models

1. Install the unit on a level surface. Ensure that there is adequate clearance at the sides and rear, as required by the specification drawings. **Anchor** the pedestal or legs securely to the floor.
2. Apply a continuous bead of clear silicone sealant (No. 732 or equivalent) to the junction between the pedestal or leg flange

and the surface, as shown. Fill all cracks and crevices, and wipe excess away.

### C. Wall-Mounted Models



**For proper sanitation, a continuous seal is required between pedestals or flanges and the mounting surface.**

1. Install a “chair carrier” in the wall to which the unit will be attached, following the instructions pertaining to anchoring and location.
2. Stub in the steam supply line and condensate return line so that they will be aligned with the appropriate fittings when the unit is mounted.

3. Mount the unit on the protruding studs of the chair carrier.
4. Apply a continuous bead of clear silicone sealant (No. 732 or equivalent) to the junction between the frame housing and the wall. Fill all cracks and crevices, and wipe away the excess.

## Initial Start-Up

### IMPORTANT

BE SURE ALL OPERATORS READ, UNDERSTAND AND FOLLOW THE OPERATING INSTRUCTIONS, CAUTIONS, AND SAFETY INSTRUCTIONS CONTAINED IN THIS MANUAL.

Now that the kettle has been installed, you should test it to ensure that it is operating correctly.

1. Remove all literature and packing materials from inside and outside of the unit.
2. Pour a small amount of water into the kettle.
3. Open the steam inlet valve.
4. When the water begins to boil, inspect all of the fittings to ensure that there are no leaks.
5. Check the safety valve by pulling out on its chain, (or lifting its lever on older models) far enough to let steam escape. Then let it snap back into place to reseal the valve so that it will not leak.



**WARNING**  
**AVOID EXPOSURE TO ESCAPING STEAM,**  
**WHICH CAN CAUSE SEVERE BURNS.**

6. Shut down the unit by closing the steam inlet valve.
7. Operate the drawoff valve to ensure that it functions across the normal range of operation.

If the unit functions as described above, it is ready for use. If the unit does not function as intended, contact your local Groen Certified Service Agency.



**Test the safety valve each day**

# OM-FT

## Operation

To heat the kettle, open the condensate return valve and the steam inlet valve. Adjusting the inlet valve allows the operator to control the heating rate. Opening the valve more allows steam to flow into the jacket faster, and thereby heats the product faster.

The kettle operates efficiently with steam pressures from five PSI to the maximum working pressure for which the kettle was designed. The maximum allowable pressure (normally 25 PSI for standard units) is stamped on the kettle nameplate.



**WARNING**  
**AVOID EXPOSURE TO ESCAPING STEAM, WHICH CAN CAUSE SEVERE BURNS.**

Once a day, while there is still steam pressure in the jacket, bleed off any entrapped air and double check the operation of the safety valve. Pull out on its chain, (or lift the lever on older models) far enough to let steam escape. Then let it snap back into place to reseal the valve so that it will not leak.

## Sequence of Operation

The following “action-reaction” outline is provided to help you understand how the equipment functions.

When the steam inlet valve is opened, steam flows into the jacket at a pressure determined by the boiler system, or by the pressure reducing valve which serves the kettle. In the jacket steam releases its heat to the kettle as it condenses into water. The steam trap allows condensate (water) to leave the kettle while holding the steam in.

When the steam supply is shut off, condensation of the remaining steam produces a vacuum in the jacket, but the check valve in the condensate return line keeps water from flowing back into the jacket.



**WARNING**  
**AVOID ALL DIRECT CONTACT WITH HOT FOOD OR WATER IN THE KETTLE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.**

**TAKE SPECIAL CARE TO AVOID CONTACT WITH HOT KETTLE BODY OR HOT PRODUCT, WHEN ADDING INGREDIENTS, STIRRING OR TRANSFERRING PRODUCT TO ANOTHER CONTAINER.**

**CAUTION**  
**DO NOT OVERFILL THE KETTLE WHEN COOKING, HOLDING OR CLEANING. KEEP LIQUIDS AT LEAST 2-3" (5-8 cm) BELOW THE KETTLE BODY RIM TO ALLOW CLEARANCE FOR STIRRING, BOILING PRODUCT AND SAFE TRANSFER.**

## Cleaning

### 1. Suggested Tools:

- a. Cleaner, such as Klenzade HC-10 or HC-32 from ECOLAB, Inc.
- b. Long- and short-handled kettle brushes in good condition.
- c. Brush suitable for cleaning the draw-off port.
- d. Sanitizer such as Klenzade XY-12.
- e. Film remover such as Klenzade LC-30.

#### CAUTION

MOST CLEANERS ARE HARMFUL TO THE SKIN, EYES, MUCOUS MEMBRANES, AND CLOTHING. PRECAUTIONS SHOULD BE TAKEN. WEAR RUBBER GLOVES, GOGGLES OR FACE SHIELD, AND PROTECTIVE CLOTHING. READ THE WARNINGS AND FOLLOW THE DIRECTIONS ON THE LABEL OF THE CLEANER CAREFULLY.

### 2. Procedure

- a. Clean food-contact surfaces as soon as possible after use, preferably while the kettle is still hot. If the unit is in continuous use, thoroughly clean and sanitize the interior and exterior at least once every 12 hours.

#### WARNING

AVOID ANY DIRECT CONTACT WITH HOT SURFACES. DIRECT SKIN CONTACT COULD RESULT IN SEVERE BURNS.

- b. Scrape and flush out food residues with lukewarm water. After flushing the kettle, close the draw-off valve.
- c. Prepare a hot solution of the detergent/cleaning compound as instructed by the supplier. Set some of this solution aside to use in cleaning the draw-off valve and pipe.
- d. Clean the unit thoroughly, inside and outside.
- e. Drain the kettle.

- f. Disassemble the tangent draw-off valve. Clean the draw-off pipe and each valve part with a brush.

#### CAUTION

DO NOT MIX DIFFERENT KETTLE DRAW-OFF ASSEMBLY PARTS WHEN WASHING. **THEY ARE NOT INTERCHANGEABLE**

- g. Rinse the kettle and draw-off parts thoroughly with warm water, then drain completely.
- h. As part of the daily cleaning, clean all external and internal surfaces that may have been soiled. Remember to check such areas as the underside of the cover.
- i. To remove burned-on materials, use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool with the cleaning solution. To reduce effort required in washing, let the detergent solution sit in the kettle and soak into the residue. **Do not use abrasive materials or metal tools that might scratch the surface.** Scratches make the surface harder to clean and provide places for bacteria to grow.
- j. **Do not use steel wool**, which may leave particles in the surface and cause eventual corrosion and pitting.



Use brushes, sponges or cloth to clean your kettles

## OM-FT



**Don't scrape with tools, steel wool or other abrasives.**

- k. The outside of the unit may be polished with a stainless steel cleaner such as "Zepper" from Zep Manufacturing Co.
- l. When equipment needs to be sanitized, use a solution equivalent to one that supplies 200 parts per million available chlorine. Obtain advice on sanitizing agents from your supplier of sanitizing products. Following the supplier's instructions, apply the agent after the unit has been cleaned and drained. Drain and thoroughly rinse off the sanitizer.

**NOTICE**  
NEVER LEAVE A CHLORINE SANITIZER IN CONTACT WITH STAINLESS STEEL SURFACES LONGER THAN 30 MINUTES. LONGER CONTACT CAN CAUSE STAINING AND CORROSION.

- m. It is recommended that each piece of equipment be sanitized just before use.
- n. If there is difficulty removing mineral deposits or a film left by hard water or food residues, clean the kettle thoroughly and use a deliming agent, like Groen Delimer/Descaler (Part Number 114800) or Lime-Away® from Ecolab, in accordance with the manufacturer's directions. Rinse and drain the unit thoroughly before further use.
- o. If cleaning problems persist, contact your cleaning product representative for assistance. The supplier has a trained technical staff with laboratory facilities to serve you.

## Maintenance

**NOTICE:** Contact Groen or an authorized Groen representative when repairs are required.

### Periodic Maintenance

A Maintenance & Service Log is provided at the back of this manual with the warranty information. Each time maintenance is performed on your Groen kettle, enter the date on which the work was done, what was done, and who did it. Keep this manual on file and available for operators to use.

Periodic inspection will minimize equipment down time and increase the efficiency of operation. The following points should be checked:

- 1. Once a day, with pressure in the jacket, check the operation of the pressure relief safety valve. Lift the lever of the safety valve until steam is released.



**WARNING**  
WHEN TESTING, AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.



**Check safety valve once each day.**

Then release the lever and let the valve snap shut. If the lever does not activate, or there is no evidence of discharge, or

the valve leaks, immediately discontinue use of the kettle and contact a qualified Groen service representative.

2. At least once every 90 days, inspect fittings and valves for signs of damage or wear.

**NOTE:** Service performed by other than factory-authorized personnel will void all warranties.

## Troubleshooting

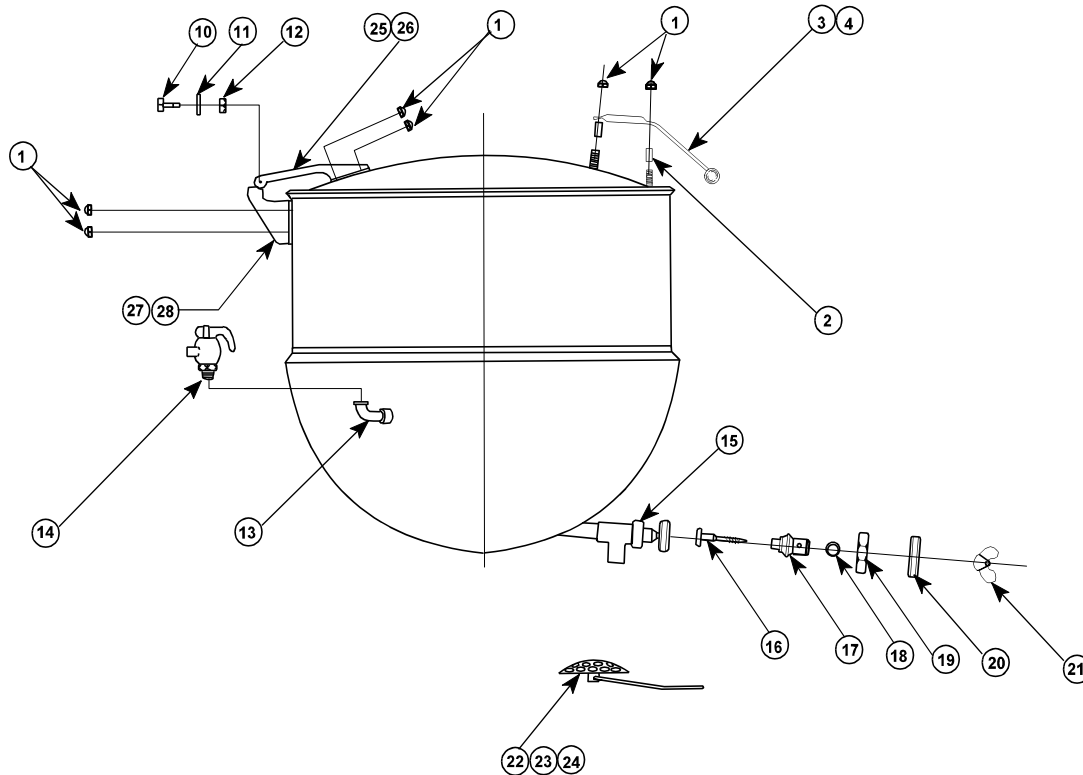
Your Groen kettle will operate smoothly and efficiently if properly maintained. However, the following is a list of checks to make in the event of a problem. **If the actions suggested do not solve the problem, call your qualified Groen Service Representative.** For the phone number of the nearest agency, call your area Groen representative or the Groen Parts and Service Department. **If an item on the list is followed by • , the work should be done by a qualified service representative.**

<b>WARNING</b>		
<b>USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR THEIR AUTHORIZED DISTRIBUTORS CAN CAUSE INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES.</b>		
SYMPTOM	WHO	WHAT TO CHECK
		<small>• indicates items which must be performed by an authorized technician.</small>
Kettle will not heat.	User	a. That the steam inlet valve is open. b. That the steam supply line is turned on. c. That the condensate return valve is open. d. That the boiler is operating properly. Steam should be supplied at a pressure greater than five PSI.
	Auth Service Rep Only	e. Steam supply line for blockage. • f. Condensate return line for blockage. • g. Steam trap operation. •
Safety valve leaks a small amount of steam.	User	a. For contamination that prevents seating the valve. With substantial pressure in the jacket, lift the valve lever briefly all the way up, to blow the valve clean then let it snap back down to seat the valve.
	Auth Service Rep Only	b. Safety valve for defects. Defective valve <b>MUST</b> be replaced with a valve rated at the same pressures. •
Safety valve leaks a large amount of steam.	Auth Service Rep Only	a. Steam supply pressure. • b. Safety valve for defects. Defective valve <b>MUST</b> be replaced with a valve rated at the same pressures. •
Pipe fitting leaks	User	a. Is the fitting tight?
	Auth Service Rep Only	b. If tightening the packing gland does not stop the leak, replace the packing. •

# OM-FT

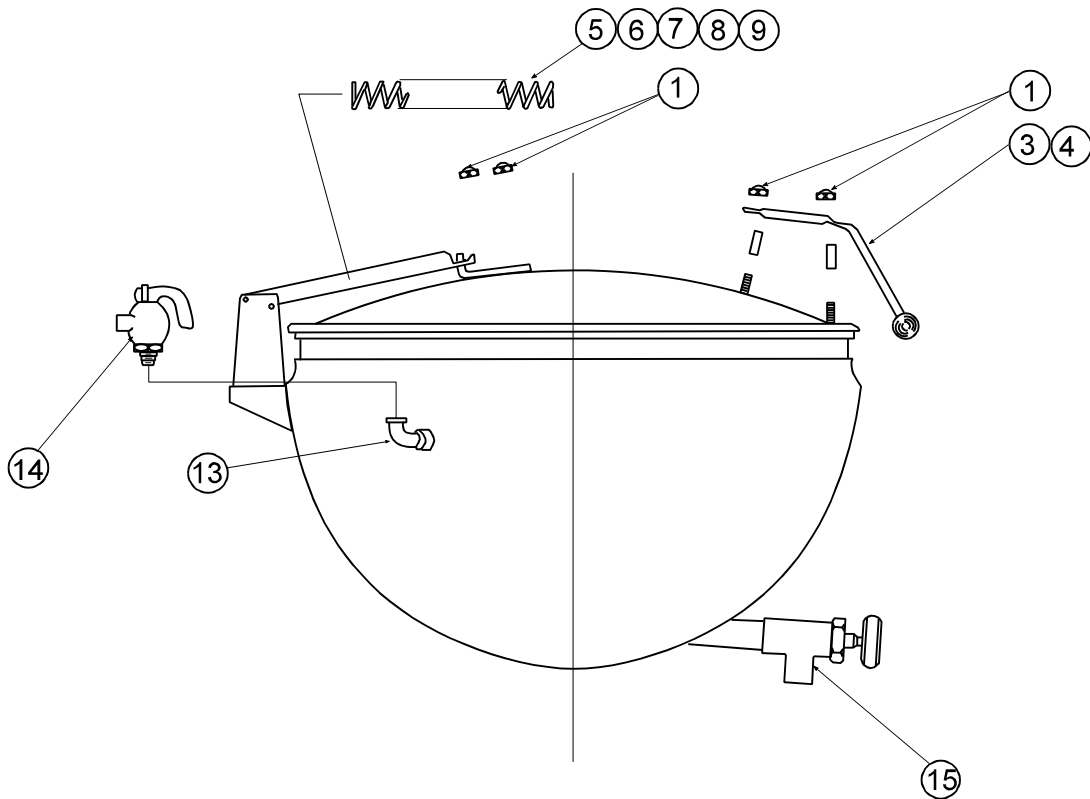
## Parts List

To order parts, contact your authorized Groen Service Agency. Supply the model designation, part description, quantity, and where applicable, voltage and phase.

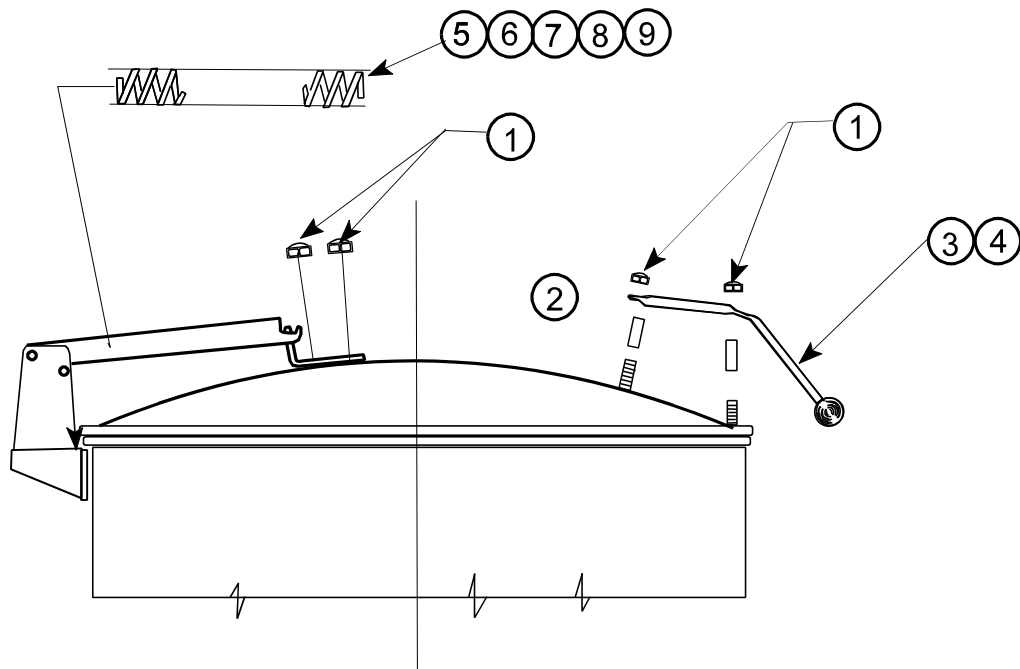


### Models FT & PT 10 to 40 Gallons Inclusive

Key	Description	Part No.	Key	Description	Part No.
1	¼"-20 N.C. Cap Nut	005471	16	Stem for 1-1/2" Valve	009027
2	Spacer	012733		Stem for 2" Valve	009048
3	Handle (Covers w/Actuator)*	047712		Stem for 3" Valve	001908
	Cover Actuator	120521	17	Bonnet for 1½" Valve	009024
	Cover Handle	120915		Bonnet for 2" Valve	009047
	U-Handle	010245		Bonnet for 3" Valve	003925
4	Knob (Friction)	012691	18	O-Ring for 1½" & 2" Valves	009034
5	Spring (28" & 30" Covers)	012303	19	Hex Nut 1½" Valve	008911
6	Spring (32" & 36" Covers)	012413		Hex Nut 2" Valve	009354
7	Spring (38" & 42" Covers)	012533		Hex Nut 3" Valve	003927
8	Spring (44" & 48" Covers)	012565	20	Handle for 1½" & 2" Valves	009029
9	Spring (50" Covers)	012566		Handle for 3" Valve	012209
10	½"-20 N.F. x 1" Lg Hex Hd Capscr.	002212	21	Wing Nut for 1½" & 2" Valves	009028
11	½" Brass Washer	002213	22	Removable Strainer 9" Dia ¼" holes	009007
12	½"-20 N.F. Jam Nut	010668	23	Removable Strainer 9" Dia C" holes	009040
13	¾" I.P.S. Street Elbow	011004	24	Removable Strainer 9" Dia no holes	009057
14	#25-¾" Safety Valve	011004		Strainer, ¼" Per.	009986
15	1½" Draw-Off Valve Complete	009000		Strainer, Vertical	009987
	1½" Draw-Off Tube	010632	25	R.H. Cover Hinge	002292
	2" Draw-Off Valve Complete	009046	26	L.H. Cover Hinge	002293
	2" Draw-Off Tube	038418	27	R.H. Hinge Half	012877
	3" Draw-Off Valve Complete	012262	28	L.H. Hinge Half	012878



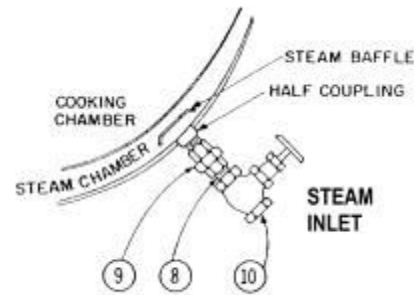
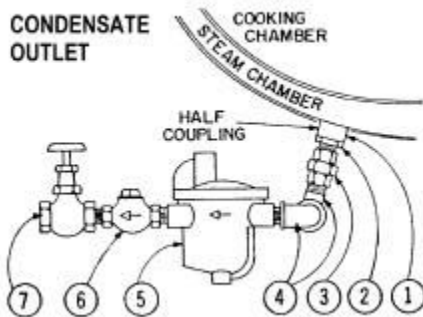
Model GPT 20



Models FT and PT 60 Gallons and Larger  
Models GT and GPT 25 Gallons and Larger

# OM-FT

## Piping Diagram\* (Bucket Type Steam Trap Assembly)



ITEM NO.	DESCRIPTION
1	Bushing
2	Close Nipple
3	Female Union
4	Street Elbow
5	Bucket Steam Trap
6	Swing Check Valve
7	Gate Valve
8	Globe Valve
9	Close Nipple
19	Female Union

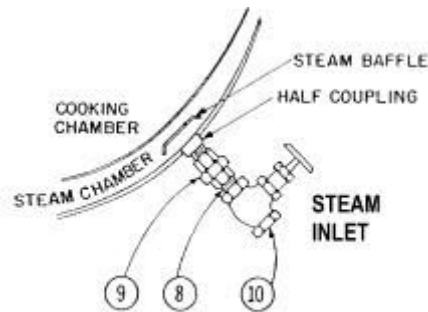
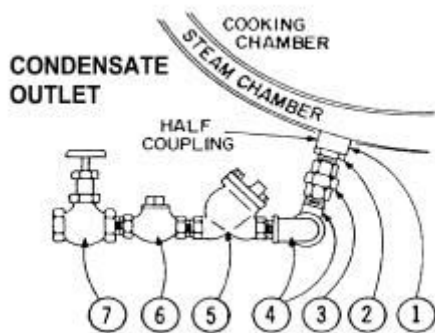
\*All of the fittings illustrated are required for proper and safer installation and operation, and are NOT PROVIDED as standard with the unit. Steam trap assemblies are available from Groen and can be purchased in two versions.

1. COMPLETELY PIPED — Complete, preassembled, with nipples and fittings, as shown in the diagram
2. LOOSE — Unassembled, without nipples and fittings, but includes steam trap, check valve, globe valve and gate valve.

*NOTE - All steam trap assemblies are shipped in a separate container and are not mounted on the kettle to prevent damage during shipment. A steam pressure reducing valve (PRV) is available at extra cost for installation when steam pressure exceeds the kettle's maximum working pressure. It is to be mounted on the steam inlet side, just before the steam valve (globe valve), as close to the kettle as possible.*

INLET SIZE	OUTLET SIZE	USED ON	PART NUMBER		
			STANDARD FINISH	ROUGH CHR. PLT.	POL. CHR. PLT.
1/2" I.P.S	1/2" I.P.S	FT - 10, 20 & 30 PT - 10, 20 & 30	025373	044884	062999
3/4" I.P.S	1/2" I.P.S	FT - 40 & 60 PT - 40 & 60 GT - 20 & 25 GPT 20 & 25	025374	040618	040624
1" I.P.S	3/4" I.P.S	FT - 80 & 100 PT - 80 & 100 GT - 40, 50, 60, 80, 100 GPT 40, 50, 60, 80, 100	025923	065788	054149

### Piping Diagram\* (Thermostatic Type Steam Trap Assembly)



ITEM NO.	DESCRIPTION
1	Bushing
2	Close Nipple
3	Female Union
4	Street Elbow
5	Thermostatic Steam Trap
6	Swing Check Valve
7	Gate Valve
8	Close Nipple
9	Female Union
10	Globe Valve

\*All of the fittings illustrated are required for proper and safer installation and operation, and are NOT PROVIDED as standard with the unit. Steam trap assemblies are available from Groen and can be purchased in two versions.

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INLET SIZE	OUTLET SIZE	USED ON	PART NUMBER		
			STANDARD FINISH	ROUGH CHR. PLT.	POL. CHR. PLT.
1/2" I.P.S	1/2" I.P.S	FT - 10, 20 & 30 PT - 10, 20 & 30	045171	059473	090530
3/4" I.P.S	1/2" I.P.S	FT - 40 & 60 PT - 40 & 60 GT - 20 & 25 GPT 20 & 25	041065	050948	040685
1" I.P.S	3/4" I.P.S	FT - 80 & 100 PT - 80 & 100 GT - 40, 50, 60, 80, 100 GPT 40, 50, 60, 80, 100	045171	048763	040686