



IMPORTANT FOR FUTURE REFERENCE Please complete this information and retain this manual for the life of the equipment:
Model #: _____
Serial #: _____
Date Purchased: _____

Installation & Operation Manual

Direct Steam Kettles Mounted on Gas Boiler Cabinet Base GMT-6, GMT-10, GMT-6-6, GMT-10-6 & GMT-10-10



Model GMT-10-10

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

CROWN FOOD SERVICE EQUIPMENT

 **MIDDLEBY** A Middleby Company

70 Oakdale Road, Downsview (Toronto) Ontario, Canada, M3N 1V9

Telephone: 919-762-1000




www.crownsteamgroup.com



SAFETY PRECAUTIONS

Before installing and operating this equipment, be sure everyone involved in its operation is fully trained and aware of precautions. Accidents and problems can be caused by failure to follow fundamental rules and precautions.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or to the equipment.

 DANGER	This symbol warns of immediate hazards that will result in severe injury or death.
 WARNING	This symbol refers to a potential hazard or unsafe practice that could result in injury or death.
 CAUTION	This symbol refers to a potential hazard or unsafe practice that could result in injury, product damage, or property damage.
NOTICE	This symbol refers to information that needs special attention or must be fully understood, even though not dangerous.

IMPORTANT NOTES FOR INSTALLATION AND OPERATION

WARNING

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

WARNING

FOR YOUR SAFETY:

Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

WARNING

Improper installation, operation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing, operating or servicing this equipment.

NOTICE

This product is intended for commercial use only. NOT FOR HOUSEHOLD USE.

NOTICE

This manual should be retained for future reference.

PURCHASER: Instructions to be followed in the event the operator of this appliance smells gas must be posted in a prominent location. This information shall be obtained by consulting the local gas supplier.

Do not attempt to operate this unit in the event of a power failure.

Keep the appliance area free and clear from combustibles.

DO NOT obstruct the flow of combustion and ventilation air.

Adequate clearances **MUST** be maintained for servicing and proper operation.

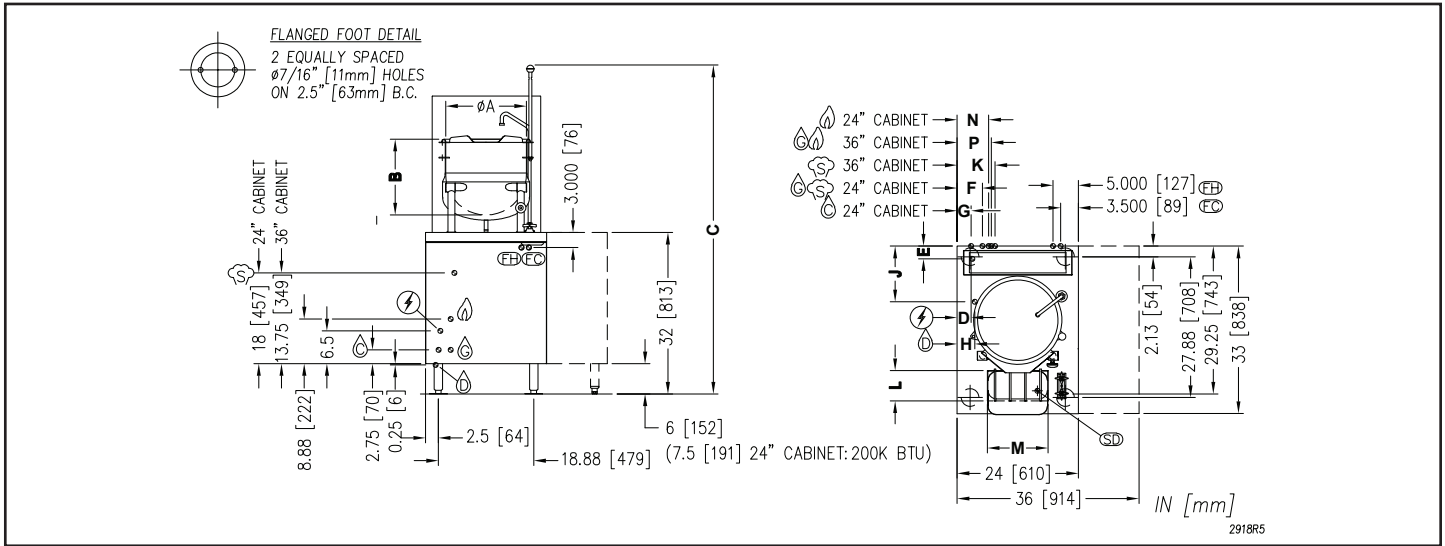
Contact the factory, the factory representative or a local service company to perform maintenance and repairs should the appliance malfunction. Refer to warranty terms.

RETAIN THIS MANUAL FOR FUTURE REFERENCE.

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SERVICE CONNECTIONS



SERVICE CONNECTIONS

- ⚡ – ELECTRICAL CONNECTION: 1/2" (13 mm) O.D. conduit connection to controls. 2 AMPS per compartment or to be as specified on data plate.
- Ⓓ – DRAIN: 2" (51 mm) IPS piped to open floor drain. No solid connection.
- Ⓒ – CONDENSATE COLD WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa).
- Ⓖ – BOILER COLD WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa). [TREATED WATER]
- Ⓕ – FAUCET COLD WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa), NSF-61 compliant.
- ⒼⒹ – FAUCET HOT WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa), NSF-61 compliant.
- ⚡ – GAS CONNECTION: 3/4" (19 mm) IPS supply line required. Natural Gas: Min. 4" (102 mm) Water Column. Propane: Min. 11" (279 mm) Water Column.
- Ⓔ – STEAM TAKE-OFF CONNECTION: 3/4" (19 mm) IPS optional to operate adjacent equipment.
- ⒻⒹ – SINK DRAIN: 1-1/8" O.D. tubing

DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
GMT-6	12 [305]	14.5 [368]	66.13 [1680]	3 [76]	2.5 [64]	5 [127]	2.75 [70]	3.5 [89]	11 [279]	7.5 [191]	9 [229]	12 [305]	6.25	6.75
GMT-10	16 [406]	15 [381]	65.13 [1654]								6 [152]	12 [305]	[159]	[171]

GAS SUPPLY AND COMPARTMENT PAN CAPACITY

BTU/HOUR	kW/HOUR	WATER COLUMN PRESSURE		MODEL	DESCRIPTION	CAPACITY	
		NATURAL	PROPANE			GALLON	LITER
200,000	58.6	min. 4" (102 mm)	min. 11" (279 mm)	GMT-6	6 gallon kettle on 24' gas boiler base	6	23
250,000	73.3			GMT-10	10 gallon kettle on 24' gas boiler base	10	38

WATER QUALITY STATEMENT

Water is the essential ingredient in steam equipment, water quality is the major factor affecting the performance of your appliance. Crown Steam Group offers a Comprehensive Water Treatment System which exceeds our minimum water requirements. Proof of installation and proper cartridges replacement is required for warranty coverage. Water supply to Crown Steam Group steamers must be within these guidelines.

Total dissolved solids.....Less than 60 PPM	ChlorineLess than 1.5 PPM
Total alkalinity Less than 20 PPM	pH Factor6.8 - 7.3
Silica..... Less than 13 PPM	

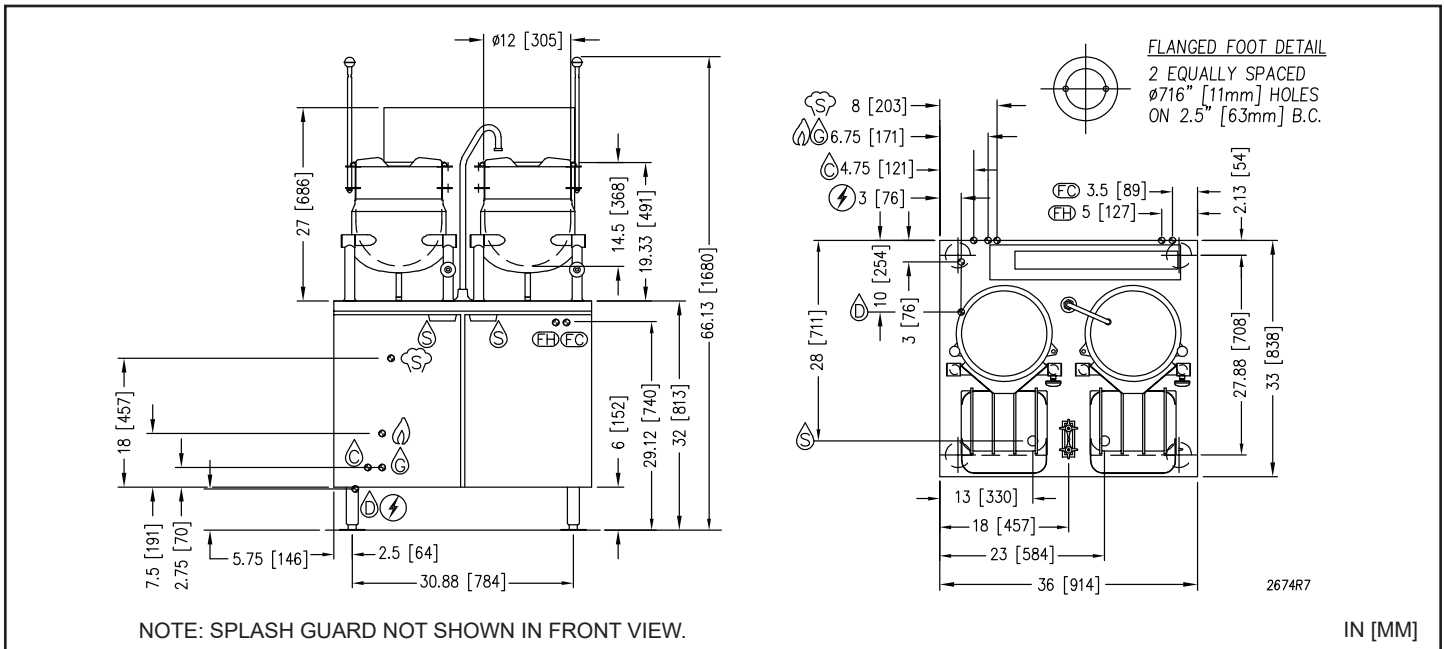
Water which does not meet these standards should be treated with the installation of Middleby's Water Treatment System. Call 919-762-1000 if you have questions concerning your water meeting these parameters.

*Failure or malfunction of this appliance due to poor water quality is not covered under warranty.
Reference www.crownsteamgroup.com for complete warranty details and instructions.

DISCLAIMER

If installing on any floor with an epoxy coating or other combustible floor surface (i.e., a surface other than quarry tile, cement or natural stone), contact the factory for installation options as damage due to improper installation is not covered under warranty.

Terry System Cartridge Changes / Installation – "2-3 gallons of water MUST be purged at each cartridge change or new installation prior to water supply being fed to the steamer. Failure to do so can result in component damage within the steamer which is not covered under warranty. For additional guidance on proper installation, refer to install documentation provided with each Terry System and Replacement Cartridge Set."



SERVICE CONNECTIONS

- E** – ELECTRICAL CONNECTION: 1/2" (13 mm) O.D. conduit connection to controls. 120 VAC-1PH with grounding wire required unless otherwise noted.
- D** – DRAIN: 2" (51 mm) IPS piped to open floor drain. No solid connection.
- C** – CONDENSATE COLD WATER: 3/8" (10 mm) NPT at 25-50 PSI (170-345 kPa).
- G** – BOILER COLD WATER: 3/8" (10 mm) NPT at 25-50 PSI (170-345 kPa). [TREATED]
- FC** – FAUCET COLD WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa), NSF-61 compliant.
- FH** – FAUCET HOT WATER: 3/8" (10 mm) O.D. tubing at 25-50 PSI (170-345 kPa), NSF-61 compliant.
- S** – GAS CONNECTION: 3/4" (19 mm) IPS supply line required.
- S** – STEAM TAKE-OFF CONNECTION: 3/4" (19 mm) IPS optional to operate adjacent equipment.
- S** – SINK DRAIN: 1-1/8" O.D. tubing

SPECIFICATIONS

MODEL	BOILER INPUT		SHIPPING WEIGHT	MIN. CLEARANCE	MODEL	DESCRIPTION	CAPACITY (PER KETTLE)	
	BTU/HOUR	KW/HOUR					GALLON	LITER
GMT-6-6	250,000	73.3	450 lbs. (204 kg)	SIDES 3 (76mm) BACK 6 (152mm)	GMT-6-6	(2) 6 gallon kettle on 36" gas boiler base	6	23
	300,00	87.9						

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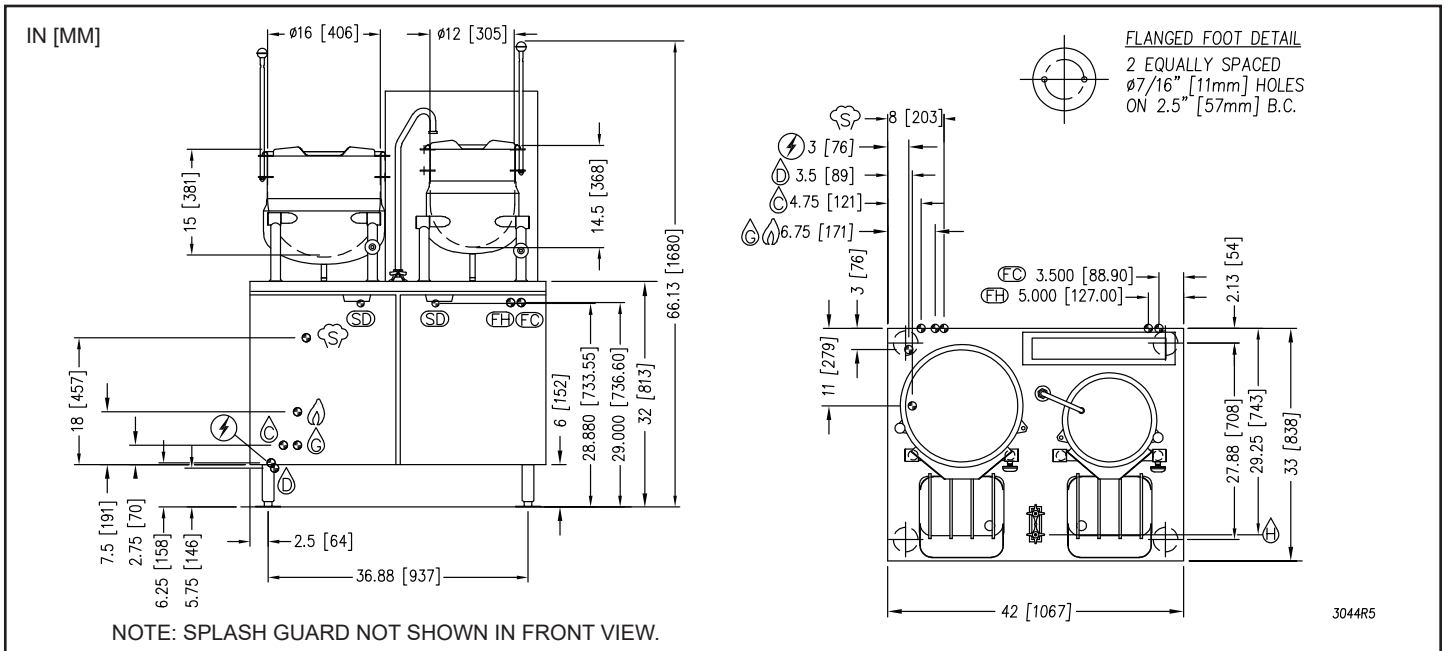
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- SINK DRAIN: 1-1/8" O.D. tubing

SPECIFICATIONS

MODEL	BOILER INPUT		SHIPPING WEIGHT	MINIMUM CLEARANCE	MODEL	DESCRIPTION	CAPACITY (PER KETTLE)	
	BTU/HOUR	KW/HOUR					GALLON	LITER
GMT-10-6	250,000	73.3	800 lbs. (368 kg)	SIDES 3 (76mm) BACK 6 (152mm)	GMT-10-6	(1) 10 gallon and (1) 6 gallon kettle on 42" gas boiler base	6	23
	300,000	87.9					10	38

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Total alkalinity	Less than 20 PPM	pH Factor	6.8 - 7.3
Silica.....	Less than 13 PPM		

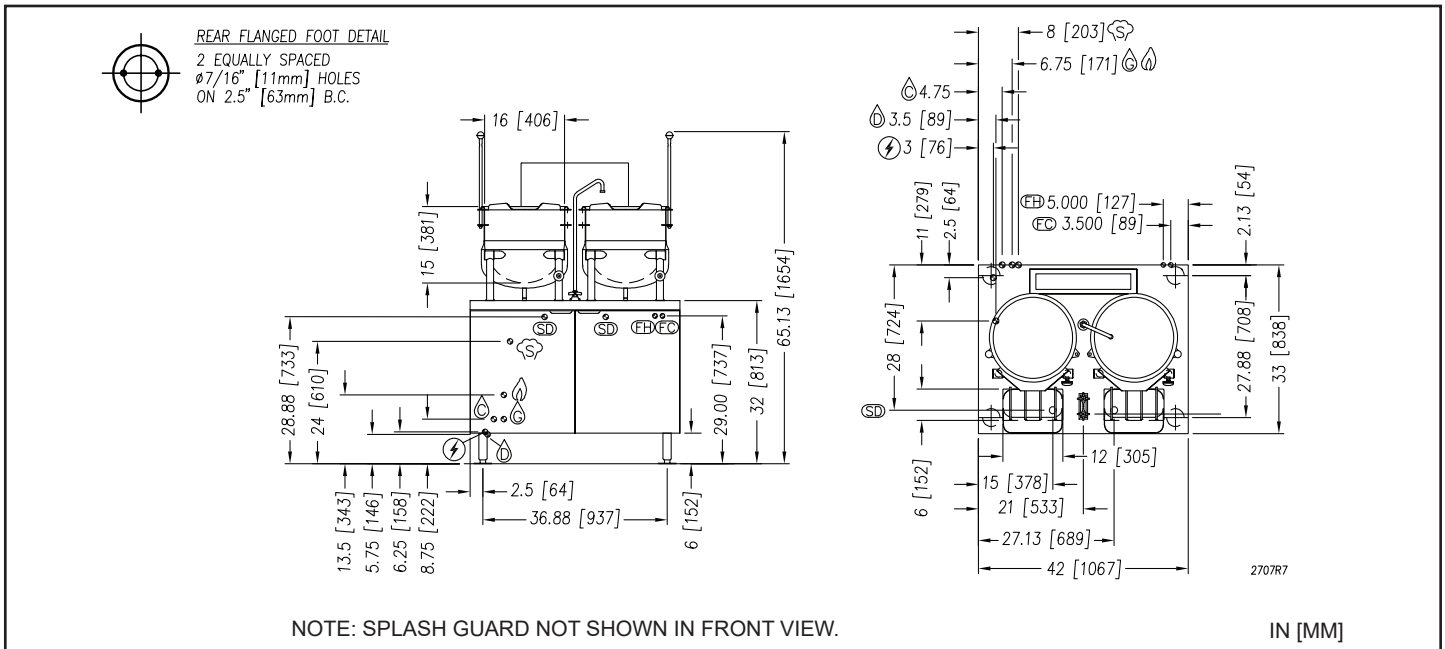
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- SINK DRAIN: 1-1/8" O.D. tubing

GAS SUPPLY AND SPECIFICATIONS

BTU/HOUR	kW/HOUR	MINIMUM INLET PRESSURE:		MODEL	DESCRIPTION	CAPACITY (PER KETTLE)		MODEL	SHIPPING WEIGHT	MIN. CLEARANCE
		NATURAL	PROPANE			GALLON	LITER			
250,000	73.3	4" W.C.	11" W.C.	GMT-10-10	(2) 10 gallon kettle on 42" gas boiler base	10	38	GMT-10-10	820 lbs. [372 kg.]	SIDES 3 [76 mm] BACK 6 [152 mm]
300,000	87.9	Static to unit	Static to unit							

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INTRODUCTION - DIRECT STEAM KETTLES

General

Direct steam jacketed kettle(s), pressure vessels of a double wall stainless steel construction forming a steam chamber (jacket) enveloping the lower two thirds of the kettle bowl surface. Kettles are mounted on a modular cabinet base housing a gas boiler designed to ASME Code and approved as a steam heating boiler restricted to operation at pressure not to exceed 15 psi. The gas boiler may be in a 24 inch cabinet base rated at 200,000 BTU, or 36 inch or 42 inch cabinet base rated at 250,000 or 300,000 BTU, operational on Natural or Propane gas. Boilers may be optional with electronic ignition and CSD-1 controls. All models are suffixed with either -6 or -10 to indicate the capacity of the kettle in US gallons.

FUNCTIONING MODE

Direct connected steam jacketed kettles consist of a stainless steel bowl and a stainless steel jacket which envelopes two thirds of the lower surface of the bowl thus forming a sealed pressure vessel (chamber) into which steam is introduced by means of a manual control valve.

The kettle bowl is the container for the food product which ideally should be of a liquid or semi-liquid consistency to achieve complete contact with the bowl surface and thus fully absorb the heat transmitted through that surface.

The temperatures required for the cooking process to function adequately must be greater than the boiling point of the liquid food product. Further, the greater the steam pressure used, the higher the temperature and consequently the quicker the cooking process. For example, steam pressurized at 30 psi attains a temperature of 274 degrees Fahrenheit (135 degrees Celsius).

In the initial stages of the cooking process when the steam comes in contact with the cold kettle bowl surface it condenses and forms considerable amounts of water. A thermostatic steam trap has been plumbed to the exit end of the kettle jacket. This trap is a mechanical device that closes on high temperatures and opens when the temperature drops thus allowing the water formed from condensate to exhaust but retain steam under pressure.

INSTALLATION INSTRUCTIONS

UNPACKING

IMMEDIATELY INSPECT FOR SHIPPING DAMAGE

Immediately after unpacking, check for possible shipping damage. If the appliance is found to be damaged, save the packaging material and contact the carrier within 15 days of delivery.

We cannot assume responsibility for damage or loss incurred in transit.

Before installing, verify that the gas (natural or propane), the elevation from sea level and the electrical supply agree with the specification on the data plate. NOTE: If this appliance is being installed above 2000 feet altitude, contact your authorized service office to assure that the proper orifice size for your elevation has been installed.

LOCATION

The installation location must be kept free and clear of combustibles. Do not obstruct the flow of combustion and ventilation air. Clearance from combustible construction must be a minimum of 3 inches from the sides and 6 inches from the back. The appliance should be installed on a noncombustible floor. Provide adequate clearances for cleaning, maintenance, service and proper operation.

Sufficient air should be allowed to enter the room to compensate for the amount of air removed by any ventilating system and for combustion of the gas burners. Do not obstruct the air flow into and around the appliance. Do not obstruct the flow of flue gases from the flue duct located at the rear and above the cabinet. Position the appliance in its final location. Check that there are sufficient clearances to service the controls, for door swings, etc., so there will be no problem in making the required supply and drain connections.

Allow enough space between any other piece of equipment or a wall for service access.

Service on the cabinet base may require access to the left and/or right side panels.

LEVELLING AND ANCHORING THE CABINET

1. Place appliance in the installation position.
2. Place a carpenter's level on top of the appliance and turn the adjustable feet to level side-to-side and front-to-back.
3. Mark hole locations on the floor through the anchoring holes provided in the rear flanged adjustable feet.
4. Remove appliance from installation position and drill holes in locations marked on the floor. Insert proper anchoring devices (not supplied).
5. Place appliance back in the installation position.
6. Place carpenter's level on top appliance and re-level side-to-side and front-to-back.
7. Bolt and anchor appliance securely to the floor.
8. Seal bolts and flanged feet with Silastic or equivalent compound.

INSTALLATION CODES AND STANDARDS

The boiler must be installed in accordance with:

Gas installation to conform to local codes, or in absence of local codes, with the National Fuel Gas Code - ANSI Z223.1/NFPA 54. In Canada installation to be in accordance with CSA B149.1 Natural Gas and Propane Installation Code.

1. The appliance and its individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of 1/2 psig (3.5 kPa).
2. The appliance must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

WIRING DIAGRAM FOR APPLIANCE IS LOCATED INSIDE CABINET DOOR.

EXHAUST FANS AND CANOPIES

Canopies are set over ranges, ovens, kettles, etc., for ventilation purposes. It is recommended that a canopy extend 6 inches past the appliance and be located 6 feet 6 inches from the floor. Filters should be installed at an angle of 45 degrees or more with the horizontal. This position prevents dripping of grease and facilitates collecting the run-off grease in a drip pan, usually installed with the filter. A strong exhaust fan tends to create a vacuum in the room and may interfere with burner performance or may extinguish pilot flames. Makeup air openings approximately equal to the fan area will relieve such vacuum. In case of unsatisfactory performance on an appliance, check with the exhaust fan in the "OFF" position.

CONNECTIONS

PLUMBING CONNECTIONS

WARNING

Plumbing connections must comply with applicable sanitary, safety, and plumbing codes.

WATER SUPPLY CONNECTION

The incoming cold water supply connection, at the rear of the appliance cabinet, requires 3/8" tubing and water pressure of 25 - 50 psi. A manual shut-off valve must be provided convenient to the appliance; this valve should be open when the boiler is in operation. Incoming hot water connection (1/2" (13 mm)) nominal tube for kettle fill faucet must be installed. See Service Connections.

IMPORTANT

If your equipment was supplied with split water lines and a filter, connect the filter system to the connection marked "BOILER FEED" only. Make a second connection to the "CONDENSER FEED" from a cold and unfiltered water supply.

FAILURE OR MALFUNCTION OF THIS APPLIANCE DUE TO POOR WATER QUALITY IS NOT COVERED UNDER WARRANTY. SEE SERVICE CONNECTIONS WATER QUALITY STATEMENT.

DRAIN CONNECTION

The steamer drain (2" IPS) should be piped to a floor drain near the steamer. There should be no solid drain connection; an "open gap" between the steamer and the floor drain is required.

GAS CONNECTION

NOTICE

If this equipment is being installed at over 2,000 feet altitude and was not so specified on order, contact service department. Failure to install with proper orifice sizing may void the warranty.

1. The data plate on the cabinet door of the boiler indicates the type of gas your unit is equipped to burn. **DO NOT** connect to any other gas type.
Keep the appliance area free and clear from combustible substances. Do not obstruct the flow of combustion and ventilation air.
2. A 3/4" NPT line is provided at the rear for the connection. Each boiler is equipped with an internal pressure regulator which is set at 3.5" W.C. manifold pressure for natural gas or 10.5" W.C. for LP gas. Use the 1/8" pipe tap on the burner manifold for checking pressure.

An adequate gas supply is necessary. Undersized or low pressure lines will restrict the volume of gas required for satisfactory performance. A steady supply pressure, between 7" W.C. and 14" W.C. for natural gas and 11" W.C. and 14" W.C. for propane gas is recommended. With all units operating simultaneously, the manifold pressure on all units should not show any appreciable drop. Fluctuations of more than 25% on natural gas, and 10% on propane gas, will create pilot problems and affect burner operating characteristics.

Contact your gas company for correct supply line sizes.

Purge the supply line to clean out any dust, dirt, or foreign matter before connecting the line to the unit.

CAUTION

The pipe thread compound used when installing pipes must be a type that is resistant to the action of liquified petroleum or propane gases.

Codes require that a gas shut-off valve be installed in the gas line prior to the steamer. Make sure the pipes are clean and free of obstructions, dirt, and piping compound.

WARNING

Never use an open flame to check for gas leaks.
Check all connections for leaks using soapy water before use.

ELECTRICAL CONNECTIONS

WARNING

Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or other local codes.

WARNING

Do not connect the appliance to the electrical supply until after the gas connection has been made.

Refer to the electrical diagram located inside cabinet on door.

When making electrical connections, use copper wire suitable for at least 200 °F (90 °C). The steamer must be grounded in accordance with the National Electrical Code or applicable local codes.

OPERATION

OPERATING INSTRUCTIONS

WARNING

Do not force the gas control knob. Use only your hand to turn the gas control knob. Never use any tool. If the gas control knob will not operate by hand the gas control should be replaced by a qualified service technician.

WARNING

Do not disassemble the gas control; it contains no replaceable components. Attempted disassembly or repair may damage the gas control.

WARNING

In the event of main burner ignition failure, a 5 minute purge period must be observed prior to re-establishing ignition source.

WARNING

If you smell gas during the lighting procedure, immediately shut off the gas supply until the leak has been corrected.

For CSD-1 equipped boilers, see this section for Operation Instructions for CSD-1 Equipped Boilers.

BOILER CONTROLS (Inside Cabinet)

- | | |
|--------------------------------|--|
| Main Power Switch | - ON fills the boiler tank and turns the boiler controls on. You should allow 20 minutes to fill the tank and generate steam. |
| | - OFF shuts off the boiler controls and opens the automatic blowdown valve, emptying the boiler tank and releasing water and steam to the drain. This should be done at least once daily to remove sediment, lime, or scale. |
| Pilot Light | - Indicates main power is ON. |
| Boiler Pressure Gauge | - Should read 9 -11 psi during operation; 0 psi during shutdown. |
| Water Level Sight Glass | - Observe level of water in the boiler and water quality. Murkiness in the water indicates inadequate water quality; the owner must supply proper water to the boiler (see Service Connections Water Quality Statement). |
| Water Level Control | - While ON, briefly open the water level control daily to remove any sediment that might accumulate. |
| Safety Valve | - This valve will release (pop off) if the boiler has too much pressure. Once a week, this valve should be tripped during operation to make sure it functions properly. |

OPERATING PROCEDURES

CAUTION

The appliance and its parts are hot. Use care when operating, cleaning and servicing the appliance.

WITH BOILER IN OPERATION MODE

1. Fill kettle with product to desired level.
2. Slowly turn the steam control valve ON to full open position.

3. The water or food should boil 3 - 4 minutes per gallon. If it does not, then incoming pressure should be checked to determine that it is adequate to operate the kettle efficiently.
4. Regulate steam control valve depending on type of food being prepared.
5. When food is cooked, turn off steam, remove food and clean kettle immediately to prevent residue from drying on kettle bowl surface.

 **WARNING**

In the event you smell gas, shut down equipment at the main shut off valve and contact the local gas company or gas supplier for service.

1. START-UP - BOILER OPERATION WITH STANDING PILOT IGNITION

Open manual gas shut off supply valve and if the appliance has a manual blowdown valve, close it. Open cabinet door and turn ON power switch located on left side. Green pilot light will come on, water will begin to enter boiler and required water level will be reached in about three minutes. Observe water gauge glass to verify.

The dial on the combination gas control valve has three positions (ON-PILOT-OFF) for manual gas control of main burners and pilot. Turn DIAL to PILOT. Depress dial and light pilot burner located on centre main burner of boiler. Maintain dial in depressed position for about 30 seconds and release. Observe that the pilot burner flame stays on. If at any time the flame should become extinguished, a 5 minute period of complete shut off of gas supply is required before relighting.

Turn dial to ON and burners should ignite. Steam generation will now commence and be completed in approximately 15 minutes. Steam generation should reach approximately 11 psi as indicated on the pressure gauge on the boiler.

2. START UP - BOILER OPERATION WITH ELECTRONIC IGNITION

Open manual gas supply valve.

Open cabinet door and turn main power switch ON. Green pilot light will come on, water will begin to enter boiler and required water level will be reached in about three minutes. Observe water gauge sight glass to verify.

The dial on the gas combination control valve has two positions (ON and OFF).

ON - [Rotated counterclockwise] permits gas to flow to the pilot and main burner.

OFF - [Rotated clockwise] prevents gas flow to pilot and main burner.

NOTICE

Units are shipped with the control in the ON position.

With the gas control valve, power switch and water supply all ON, water begins entering the boiler and gas flows to the pilot: Spark will begin in 2 to 3 seconds. If the pilot fails to light in 90 seconds, the control will provide 100% lockout. If this occurs: Wait 5 minutes, then turn power switch off for one minute before turning power switch back on.

Once the pilot is lit and the required water level has been reached, the main burners will ignite. Burner will cycle to meet the steam pressure required. Steam pressure should reach approximately 11 psi as indicated on the pressure gauge on the boiler.

DAILY SHUT DOWN

Turn power switch off.

Open manual blowdown valve if so equipped.

COMPLETE BOILER SHUT DOWN

If boiler is not intended to be operated for a lengthy period of time, shut off all power, gas and water supplies to the appliance. Open manual blowdown valve if so equipped.

OPERATION INSTRUCTIONS FOR BOILERS WITH CSD-1 CONTROLS

INITIAL START-UP PROCEDURE

1. Open the manual gas shut-off supply valve.
2. Close the manual blowdown valve, if so equipped.
3. Light the pilot burner.

The dial on the combination gas valve has three positions (ON-OFF-PILOT) for manual gas control of main burners and pilot burner. Turn the dial to PILOT. Depress the dial and light the pilot burner on the centre burner of boiler. Maintain the dial in depressed position for about 30 seconds and release. Observe that the pilot flame stays ON. Turn dial to "ON".

4. Open cabinet door and turn "ON" the power switch. The green pilot light will come "ON". Water will begin to enter the boiler. When enough water has entered the boiler the (amber) "STAND BY" pilot light will come on.
5. Press the "RESET" switch to begin boiler operation. The "STAND BY" pilot light will go off and the boiler will begin operation.

**If at anytime the flame should become extinguished,
a five (5) minute purging is required before relighting is attempted.**

DAILY STARTUP PROCEDURE

1. Close the manual blowdown valve, if so equipped.
2. Examine that the pilot burner flame is burning. If the pilot burner is out, a five (5) minute period of complete gas supply shut off is required before relighting. Follow initial start up instructions above.
3. Open cabinet door and turn "ON" the power switch. The green pilot light will come "ON". Water will begin to enter the boiler. When enough water has entered the boiler the (amber) "STAND BY" pilot light will come on.
4. Press the "RESET" switch to begin boiler operation. The "STAND BY" pilot light will go off and the boiler will begin operation.

DAILY SHUTDOWN PROCEDURE

1. Turn "OFF" the power switch. Observe that the burners go off.
2. Open the manual blowdown valve, if so equipped. If the appliance is equipped with an automatic blowdown solenoid valve, the boiler's contents, water and steam, will be blown out and exhausted through the appliance drain. The cold water solenoid valve will be activated.

COMPLETE SHUTDOWN PROCEDURE

If the appliance is not intended to be operational for a lengthy period, then shut it down completely.

1. Open the manual blowdown valve, if so equipped.
2. Shut off all supplies of power, gas and water to the appliance.

NORMAL BOILER OPERATING CYCLE

Water Fill Cycle

On the initial filling of the boiler, the reset switch must be activated to initialize the safety lockout circuit. Once the water in the boiler has reached the proper level, the level control will stop the flow of water to the boiler. As water is consumed in the production of steam, the level control will replenish water to the boiler.

Firing Cycle

The gas valve is controlled by pressure sensing devices. On initial operation of the boiler, steam generation should reach 11 psi in approximately 15 minutes. At this point the "Operating Pressure" switch will close the gas valve. When pressure drops to 9 psi, the pressure switch opens the gas valve and ignition should occur.

Should the pressure rise to more than 14.5 psi the "Override pressure switch" will open the override solenoid valve, releasing the excess steam.

Condensing Drain

A thermostat is located in the drain assembly and is activated by the temperature of steam. The thermostat opens the cooling solenoid valve, supplying water to the drain to condense the steam.

Automatic Blowdown Valve

If the unit has an automatic blowdown valve, it is activated by the main power switch. The boiler will drain should the main power switch be turned "OFF."

SAFETY LOCKOUT CONDITIONS

High Temperature Condition

A high temperature safety device is installed on the boiler. Should the temperature exceed the limit of this device, the boiler will be shut down and be put in a state of lockout. The "Temperature" pilot light (Red), and the "Standby" pilot (amber), will come on.

High Pressure Condition

A high pressure safety switch is installed on the boiler. Should the pressure exceed the limit of this device, the boiler will be shut down and be put into a state of lockout. The "Pressure" pilot light (Red), and the Stand By pilot (amber), will come on. Should this device fail to operate, the safety relief valve will open.

Low Water Condition

A second low water safety cut off is supplied with the boiler. Should the water level fall below normal operating levels, this device will activate and put the boiler in a state of lockout. The "Low Water" pilot light (Red), and the "Stand By" pilot (amber) will come on.

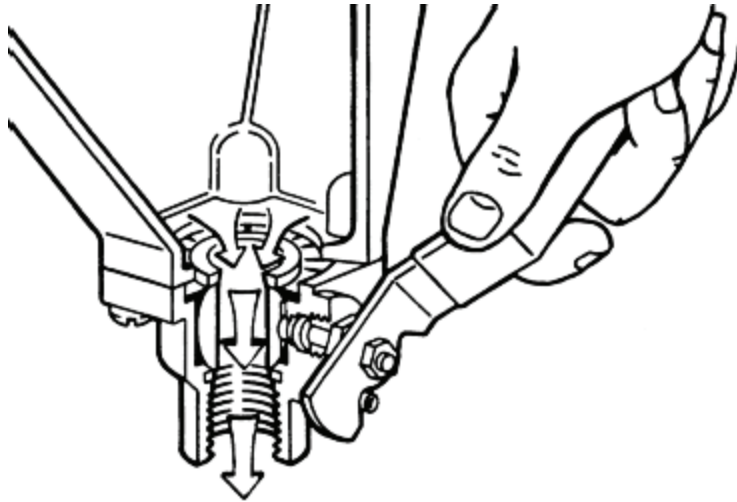
PERIODIC MAINTENANCE

WARNING

Disconnect the unit from the power supply before cleaning or servicing appliance.

IMPORTANT INSTRUCTIONS

Be sure to flush your boiler water level control daily. Failure to follow this procedure can cause the control to malfunction resulting in serious boiler damage.



The Boiler Water Level Control installed on your boiler requires periodic maintenance. As boiler water circulates into the float chamber, sand, scale and other sediment may be deposited in the float chamber. While the chamber has been designed with a large accumulation bowl, it is necessary to flush the sediment from the chamber by blowing down the control so that the accumulation of sediment does not interfere with the movement of the float in the control.

Control must be flushed at least once a day.

CAUTION

Protect yourself. When flushing control, hot water and steam will flow out of the drain.

When flushing control, note water level in gauge glass, allow the boiler to fill if necessary and also to come up to temperature.

Before flushing control, note that water level in gauge glass is within operating range and the boiler pressure is at least 6 psi. While the boiler is being fired, open blowdown valve at bottom of control by rotating the handle counterclockwise about 1/4 turn to fully open the valve

Opening the blowdown valve also checks the cut-off operation. Float should drop shutting burners off, hot water and steam will flow out the drain flushing away sediment.

CAUTION

If burner does not shut off during blowdown, immediately discontinue use of appliance and call for service.

Continue draining water for about fifteen (15) seconds, from control until water is clean. Manually close valve. Recheck gauge glass. If water level has dropped significantly, wait for the boiler to restore water level and pressure and repeat if necessary.

 **WARNING**

Disconnect the unit from the power supply before cleaning or servicing appliance.

1. If water in sight glass is not clear and appears murky, this indicates poor water quality and may cause control failure (see Service Connections Water Quality Statement).
2. Safety valve should be tripped during operation once a week to ensure that it is functioning properly.
3. Clean around burners and orifices if lint has accumulated.
4. Visually ensure carry over ports are unobstructed.
5. Visually check that the flue is not obstructed.

 **CAUTION**

DO NOT allow water near the electrical components.

CLEANING

At the end of the day, turn the Main Power Switch OFF (automatic blowdown drains the boiler tank) or if equipped with manual blowdown valve, open. Wash exterior with mild detergent and warm water, rinse, and wipe dry. Do not use steel wool on stainless steel surfaces.

REMOVAL OF LIME SCALE DEPOSITS

The interior of the steam boiler should be inspected at least twice a year by your authorized servicer to determine whether the boiler needs to be delimed. The servicer should perform any necessary deliming procedure (See Descaling instructions).

VENT HOOD

Twice a year check the venting system (hood); remove any obstructions; and clean as necessary.

NOTICE

Contact the factory, the factory representative or local service company to perform maintenance and repairs.

CLEANING

 **WARNING**

Disconnect the unit from the power supply before cleaning or servicing appliance.

 **CAUTION**

Do not use cleaning agents that are corrosive.

 **CAUTION**

DO NOT allow water near the electrical components.

Your kettle should be cleaned immediately after each use.

1. Ensure that steam supply is OFF.
2. Pre-rinse inside of kettle thoroughly and tilt to remove any food particles.
3. Using a nylon brush, clean kettle with a mild detergent and warm water rinse. Never use steel wool or scouring powder as it will scratch stainless steel.
4. Tilt kettle and rinse thoroughly draining out detergent solution.

Use of cleaning agents that contain chloride, acids or salts are corrosive and may cause pitting and corrosion when used over a period of time; this will reduce the life of the appliances.

Should pitting or corrosion occur this is not covered by warranty.

Follow the recommended cleaning instructions. Use a mild detergent, warm water and rinse thoroughly.

At the end of the day, turn the Main Power Switch OFF (automatic blowdown drains the boiler tank) or if equipped with manual blowdown valve, open. Wash exterior with mild detergent and warm water, rinse, and wipe dry. Do not use steel wool on stainless steel surfaces.

WHAT TO DO IF SURFACE RUST APPEARS

Metal utensils should never be used as they will scratch the surface of the equipment and rust may begin to form. To remove surface accumulation of rust from the inadvertent use of such utensils, the following procedure may be used.

 **CAUTION**

Improper use of this procedure may damage your appliance!

1. Use undiluted white vinegar with a non-abrasive scouring pad (plastic) or cloth on the affected area to remove the rust stain. The appliance should not be heated and remain at room temperature during the entire cleaning process.
2. If the stain resists removal, additional exposure time with vinegar may be required, to a maximum of one hour.
3. Thoroughly wash all of the vinegar away with fresh clear water. Dry the surface completely and allow one hour before using the appliance to cook.

Following daily and period maintenance procedures will prolong the life for your equipment. Climatic conditions - salt air - may require more thorough and frequent cleaning or the life of the equipment could be adversely affected.

ADJUSTMENTS

NOTICE

Contact the factory, the factory representative or local service company to perform maintenance and repairs.

At least twice a year have an authorized service technician clean and adjust the unit for maximum performance.

BOILER DESCALING INSTRUCTIONS

It is recommended that the boiler be checked every 90 to 120 days for scale build up. Regular maintenance should be carried out at this time.

If the boiler is descaled, a new Anode should be installed in the boiler to help extend its life.

1. With boiler empty, close manual blowdown valve. If appliance is equipped with automatic blowdown, turn water supply OFF to appliance. Turn power switch ON. This will energize and close blowdown valve.
2. Remove 3/4" pipe plug from fitting on left front of boiler.
3. Insert appropriate hose or tube through fitting and pour in (1/2) half gallon (U.S.) of CLR Descaling solution.
Or use the Optional Deliming assembly DPA-1 available from your dealer. For appliances equipped with CSD-1, descaling solution must be introduced through hand hole.
4. Replace 3/4" pipe plug securely.
5. Open water supply to appliance allowing water to fill boiler to required level.
6. Let appliance cycle, allowing two hours for descaling and cleaning. **DO NOT TURN STEAM ON TO CONNECTED APPLIANCES OR TO UPPER COMPARTMENTS.**
7. Open both the blowdown and low water level control valves for complete drainage. Then close both valves.
For appliances equipped with automatic blowdown, turn OFF power switch and open low water control valve. This will allow complete drainage. Once drained close water level control valve.
8. Turn appliance switch ON. When boiler is completely filled, turn power switch OFF. This will rinse and drain boiler. Appliance with manual blowdown valve must be opened to drain.
9. Complete Step 8 twice to assure boiler is completely rinsed.
10. Appliance is now ready for use.

CALIBRATE PRESSURE SWITCHES

NOTICE

Pressure switches are factory set. Calibration is only required if pressure switches are replaced or if adjustment is required.

Pressure switch range is from 1 to 15 psi.

Adjust all settings to maximum on high signal adjustment screw on pressure switches.

Adjust in the following sequence:

- High limit pressure switch.
- Override pressure switch.
- Operating pressure switch.
- Turning screw clockwise to increase, counterclockwise to decrease pressure.
- Use relief valve to release pressure from boiler for setting adjustments.

1. HIGH LIMIT PRESSURE SWITCHES

Allow pressure to build until unit shuts off. This should occur at 15 psi. Set the high signal to switch at 14.5 psi on the gauge and the low signal to 13.0 psi.

2. OVERRIDE PRESSURE SWITCHES

Allow pressure to increase to 13 psi. Set the high signal to switch at 13 psi on the gauge and the low signal to 11 psi.

3. OPERATING PRESSURE SWITCHES

Set the high signal to switch at 11 psi on the gauge and the low signal to 9 psi.

4. Release pressure in boiler to below 9 psi. Burner will come on. Once pressure has reached 11 psi, burners will shut off. Repeat this process several times to make sure burners come on at 9 psi and shut off at 11 psi.

Once completed, pressure switches have been calibrated.

Should your unit not have the High Limit pressure switch, start procedure at Override pressure switch.

SERVICE

NOTICE

Contact your local authorized service office for any repairs or adjustments needed on this equipment.

TROUBLESHOOTING

NOTICE

Contact the factory, the factory representative or local service company to perform maintenance and repairs.

BURNERS PRODUCE CARBON DEPOSITS

1. Wrong size orifices.
2. Burner air not adjusted properly.
3. Wrong gas supply.
4. Incorrect pressure at supply.

PILOT LIGHT DOES NOT LIGHT OR GOES OUT

1. Gas not on.
2. Power supply is off.
3. Gas control knob is off.
4. Low incoming gas pressure.
5. Check thermocouple millivolts.
6. Dirty or loose wire connection to ignition module. Clean and/or tighten.
7. Pilot outage due to draft, excess steam from drain or unit not level. Improper venting can direct the flame away from the thermocouple or flame sensor.
8. Ignitor cable shorting out. Check that it is not contacting with metal or isn't damaged. May require replacement.
9. Ignition module not receiving power. Check output voltage from transformer is 24 volts.
10. Unit in 100% lock out. Turn off and try again in five minutes.
11. Cracked ceramic insulator on pilot/ignitor sensor. Replace.
12. No spark, ignition module malfunction. Replace.
13. Pilot not adjusted correctly.

BURNER DOES NOT COME ON

1. Gas supply to unit is "OFF".
2. Manual shut off valve is "OFF".
3. Power supply is "OFF".
4. Faulty valve or ignition module.
5. Pilot out.
6. Pilot may require flame adjustment.
7. Water level has not been reached in boiler. Check water supply is on, check water level control.
8. If water at proper level, check relay which energizes pressure switch and gas control.
9. Pressure switch may need to be replaced if relay is operating.
10. Gas control may also require replacement if energized but not operating.
11. High Limit Thermostat open.

SAFETY RELIEF VALVE BLOWS

1. Defective safety valve.
2. Pressure too high. Pressure switch requires adjustment (lower) or may be defective.

WATER NOT BEING SUPPLIED TO BOILER

1. Water supply is "OFF".
2. Defective water fill solenoid valve.
3. Water level control clogged or defective, unable to operate fill valve.
4. Check drain valve is closed.
5. Supply water pressure too low.

BOILER SLOW TO HEAT UP

1. Heavy build up of lime or scalant hampering heat transfer. Call for service to inspect interior of boiler. Should a considerable amount of scalant be found, have steam lines, water level control and valve also inspected.

NOTES

GMT-6, GMT-10, GMT-6-6, GMT-10-6 & GMT-10-10 Direct Steam Kettles Mounted on Gas Boiler Cabinet Base



A product with the Crown name incorporates the best in durability and low maintenance. We all recognize, however, that replacement parts and occasional professional service may be necessary to extend the useful life of this appliance. When service is needed, contact a Crown Authorized Service Agency, or your dealer. To avoid confusion, always refer to the model number, serial number, and type of your appliance.



CROWN FOOD SERVICE EQUIPMENT

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