# Operators Manual

## Installation, Operation & Service

# Gas Floor Model Kettles

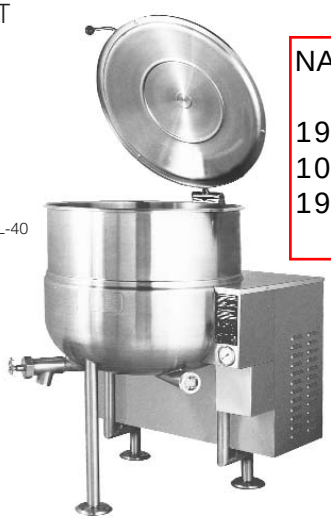
**MODELS**:

***Stationary -*** KGL-40, KGL-60, KGL-80, KGL-100
***Tilting -*** KGL-40-T, KGL-60-T, KGL-80-T
***Short Series -*** KGL-40-SH, KGL-60-SH, KGL-40-TSH

NAT gas KGL80 kettle

190000 BTU/hr
1000 BTU/Ft3 for standard for NAT gas
190000 /1000 =190 CFH

KGL-40-T



KGL-40

KGL-40SH

Cleveland

Enodis

*1333 East 179th St., Cleveland, Ohio, U.S.A. 44110*

*Phone: (216) 481-4900 Fax: (216) 481-3782*
*Visit our web site at www.clevelandrange.com*

SE95003-1 Rev. 6

# FOR THE USER

## IMPORTANT!

**PRIOR TO REMOVING ANY FITTINGS ENSURE KETTLE IS AT ROOM TEMPERATURE AND PRESSURE GAUGE IS SHOWING ZERO OR LESS PRESSURE**.

**FOR YOUR SAFETY**

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

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

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## IMPORTANT

The following points are to insure the safe installation and operation of this equipment:

- Insure all gas and electrical supplies match rating plate and electrical stickers.
- Observe all clearance requirements.
- Disconnect the electrical power supply to the appliance before cleaning or servicing unit.
- All service must be performed by a qualified Cleveland Range Technician.
- Do not obstruct the flow of combustion and ventilation air.

The installation and connection must comply with current local codes, or in the absence of local codes, with CAN/CGA-B149.1 and .2 installation code or with the national fuel gas code, ANSI Z223.1-L988.

Post in a prominent location, instructions to be followed in the event the user smells gas. This information shall be obtained by consulting your local gas supplier.

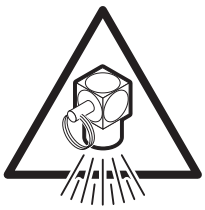
The appliance and its individual shut off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig. (3.45 kpa).

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. (3.45 kpa).

**RETAIN THIS MANUAL FOR YOUR REFERENCE.**

# *For your safety*

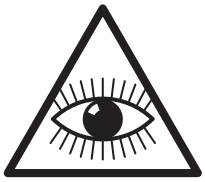
## DANGER



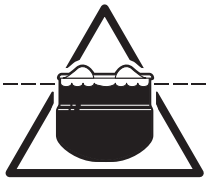
Keep clear of pressure relief discharge.

Keep hands away from moving parts and pinch points.

## IMPORTANT



Inspect unit daily for proper operation.



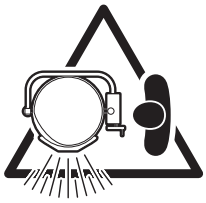
Do not fill kettle above recommended level marked on outside of kettle.

## CAUTION

Surfaces may be extremely hot! Use protective equipment.

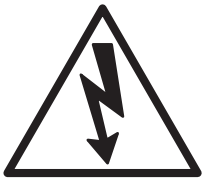
Wear protective equipment when discharging hot product.

Do not lean on or place objects on kettle lip.



Stand clear of product discharge path when discharging hot product.

## SERVICING



Shut off power at main fuse disconnect prior to servicing.


Ensure kettle is at room temperature and pressure gauge is showing zero or less prior to removing any fittings.

## GAS APPLIANCES

Do not attempt to operate this appliance during a power failure.

Keep appliance and area free and clear of combustibles.

# INSTALLATION

## INSPECTION

Before unpacking visually inspect the unit for evidence of damage during shipping.

If damage is noticed, do not unpack the unit, follow shipping damage instructions.

## SHIPPING DAMAGE INSTRUCTIONS

If shipping damage to the unit is discovered or suspected, observe the following guidelines in preparing a shipping damage claim.

1. Write down a description of the damage or the reason for suspecting damage as soon as it is discovered. This will help in filling out the claim forms later.
2. As soon as damage is discovered or suspected, notify the carrier that delivered the shipment.
3. Arrange for the carrier's representative to examine the damage.
4. Fill out all carrier claims forms and have the examining carrier sign and date each form.

## GENERAL

Installation of the kettle must be accomplished by qualified installation personnel working to all applicable local and national codes. Improper installation of product could cause injury or damage.

This equipment is built to comply with applicable standards for manufacturers. Included among those approval agencies are: UL, A.G.A., NSF, ASME/N.Bd., CSA, CGA, ETL, and others. Many local codes exist, and it is the responsibility of the owner/installer to comply with these codes.

Observe all clearance requirements to provide proper make-up air flow. Do not obstruct the flow of combustion and ventilation air. Check rating plate to ensure that kettle has been equipped to operate with the type of gas available at the installation.

## VENTILATION

Gas fired kettles are only to be installed under a ventilation hood in a room which has provisions for adequate make up air. Further information can be obtained by referring to the U.S.A. National Fire Protection Associations NFPA96 regulations. These standards have also been adopted by the National Building Code in Canada.

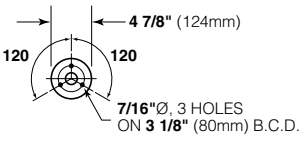
## CLEARANCE REQUIREMENTS

This unit must be installed in accordance with the clearances shown on the rating label which is adhered to the unit.

**FOR YOUR SAFETY**. Keep the appliance area free and clear of combustible materials.

## INSTALLATION

1. Position the unit in it's permanent location, and level the unit by turning the adjustable feet.
2. Once positioned and leveled, permanently secure the unit's flanged feet to the floor using 5/16" lag bolts and floor anchors (supplied by the installer). Three bolts are required to secure each of the flanged feet.




FLANGED FOOT DETAIL
(REAR LEGS ONLY)

3. Seal joints of flanged feet with a silicone sealant.

## GAS

***ENSURE THE GAS SUPPLY MATCHES THE KETTLE'S REQUIREMENTS AS STATED ON THE RATING PLATE.***

It is recommended that a sediment trap (drip leg) be installed in the gas supply line. If the gas pressure exceeds 14” water column, a pressure regulator must be installed, to provide a maximum of 14” water column gas pressure to the gas control valve.

Connect the gas line to the manual valve located at the rear of the control box.

Installation must be in accordance with local codes and/or the National Fuel Gas Code ANSI Z223.1 Latest Edition (USA) or the latest Installation Codes for Gas Burning Appliances and Equipment CAN/ CGA B149.1 and CAN/ CGA B149.2 (Canada). Use a gas pipe joint compound which is resistant to L.P. gas. Test all pipe joints for leaks with soap and water solution. Ensure that the gas pressure regulator is set for the manifold pressure indicated on the gas rating plate.

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 test pressures in excess of 1/2 psi (3.45 kPa). 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 psi (3.45 kPa).

# ELECTRICAL

***ENSURE THE ELECTRICAL SUPPLY MATCHES THE KETTLE'S REQUIREMENTS AS STATED ON THE RATING LABEL.***

A cord and plug are supplied with the unit. Simply plug the unit into any grounded outlet rated for a minimum of 10 amps. The wiring diagram is located under the cover of electrical box inside the back console.

**WARNING:** Electrical Grounding Instructions.

This unit is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug. Standard supply voltage is 115 volts A.C., however, optional A.C. voltages can be supplied on special order. A separate fused disconnect switch must be supplied and installed in the high voltage electrical supply line. The kettle must be electrically installed and grounded in accordance with local codes, or in the absence of local codes, with National Electrical Code, ANSI/NFPA 70-1990 (USA) or the Canadian Electrical Code, CSA C22.2, Part 1 (Canada).

# WATER

The sealed jacket of the gas-fired kettle is precharged with the correct amount of a water-based formula, and therefore, no water connection is required to the kettle jacket. The kettle can be equipped with optional hot and cold water taps, requiring 1/2" copper tubing as supply lines.

# CLEANING

After installation the kettle must be thoroughly cleaned and sanitized prior to cooking.

# INSTALLATION CHECKS

Although the kettle has been thoroughly tested before leaving the factory, the installer is responsible for ensuring the proper operation of kettle once installed.

***DO NOT ATTEMPT TO OPERATE THIS APPLIANCE DURING A POWER FAILURE.***

***KEEP APPLIANCE AND AREA FREE AND CLEAR OF COMBUSTIBLES.***

1. Before turning the kettle on, read the vacuum/pressure gauge. The gauge's needle should be in the green zone. If the needle is in the "VENT AIR" zone, follow air venting procedure.
2. Unit has been thoroughly checked for gas leaks at the factory however the installer should check all connections using soap bubble or gas detector for any leaks which may have resulted from shipping or installation.
3. Supply power to the kettle by placing the fused disconnect switch to the "ON" position.
4. Open gas shut-off valve to turn on main gas supply..
5. Turn the temperature control knob to "**1**" (Min.). The green LED light should remain lit, indicating the burner is lit, until the set temperature is reached. Then the green light will cycle on and off, indicating the burner is cycling on and off to maintain temperature.
6. Tilt the kettle forward. After a few seconds the red "LOW WATER" light should be lit when the kettle is in a tilted position. This light indicates that the burner has automatically been shut off by the kettle's safety circuit. This is a normal condition when the kettle is in a tilted position.
7. Raise the kettle to the upright position. The red "LOW WATER" light should go out when the kettle is upright.
8. Turn the temperature control knob to "**10**" (Max.) and allow the kettle to preheat. The green light should remain on until the set temperature is reached. Then the green light will cycle ON and OFF, indicating the burner is cycling ON and OFF to maintain temperature.

# OPERATING INSTRUCTIONS


Operating Controls & Indicators

| ITEM # | DESCRIPTION | FUNCTION |
|---|---|---|
| 1. | Low Water Indicator Light (Red) | When lit, indicates that the kettle is low on water and will not operate in this condition. This will also light when the kettle is in the tilted position. |
| 2. | On-Off Switch/ Solid State Temperature Control | Turns kettle ON/OFF and allows the operator to adjust the kettle temperature in increments from 1 (Min.) to 10 (Max.). (see the TEMPERATURE RANGE CHART). |
| 3. | Heat Indicator Light (Green) | When lit, indicates that the kettle's burner is on. Cycles ON-OFF with burner. |
| 4. | Vacuum/Pressure Gauge | Indicate steam pressure in PSI inside steam jacket as well as vacuum in inches of mercury. |
| 5. | Pressure Relief Valve (not shown) | This valve is used to vent the kettle and in the unlikely event there is an excess steam build-up in the jacket, this valve opens automatically to relieve this pressure. |
| 6. | Water Level Sight Glass | Displays water level in steam jacket. |
| 7. | Tilt Wheel | Used for tilting the kettle on hand tilt models. In power tilt models there is a toggle switch in same location. |
| 8. | Flue | |
| 9. | Tangent Draw-Off Valve | Used for draining product or wash water from kettle. It is supplied as standard equipment on stationary kettles and is optional on tilting kettles. |

# OPERATING THE KETTLE

***DO NOT ATTEMPT TO OPERATE THIS APPLIANCE DURING A POWER FAILURE.***

***KEEP APPLIANCE AND AREA FREE AND CLEAR OF COMBUSTIBLES.***

***DO NOT LEAN ON OR PLACE OBJECTS ON KETTLE LIP. SERIOUS INJURY COULD RESULT IF KETTLE TIPPED OVER, SPILLING HOT CONTENTS.***

***IF YOU ARE COOKING AN EGG OR MILK PRODUCT, DO NOT PRE-HEAT KETTLE.***

1. Before turning kettle on, read the Vacuum/Pressure Gauge (**5**). The gauges needle should be in the green zone. Once heated, the kettle's normal maximum operating pressure is approximately 10-12 psi while cooking a water base product.

2. Ensure that the electrical service to the kettle is turned on at the fused disconnect switch.

| Temperature Control Setting | Approximate Product Temperature °F | °C |
|---|---|---|
| **1.** | 120 | 49 |
| **2.** | 135 | 57 |
| **3.** | 150 | 66 |
| **4.** | 165 | 74 |
| **5.** | 180 | 82 |
| **6.** | 195 | 91 |
| **7.** | 210 | 99 |
| **8.** | 225 | 107 |
| **9.** | 245 | 118 |
| **10.** | 265 | 130 |

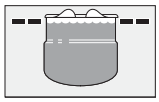
**NOTE:** Certain combinations of ingredients will result in temperature variations

Temperature Range Chart

3. Preheat the kettle by turning the ON/OFF Switch/Solid State Temperature Control (**2**) to the desired temperature setting (see above "Temperature Range Chart"). The Heat Indicator Light (Green) (**3**) will remain lit, indicating the burner is on, until the temperature setting is reached. When the green light goes off, the burners are off, and preheating is complete.

**NOTE:** When cooking egg and milk products, the kettle should not be preheated, as products of this nature adhere to hot cooking surfaces. These types of food should be placed in the kettle before heating is begun.

4. Place food product into the kettle. The green Heat Indicator Light (**3**) will cycle on and off indicating the burners are cycling on and off to maintain the set temperature.



**NOTE:** Do not fill kettle above recommended level marked on outside of kettle.

**NOTE:** The Low Water Indicator Light (Red) (**1**) should not be lit during kettle operation. This light indicates that the burners have been automatically shut off by the kettle's safety circuit. It is normal for the red light to come on when the kettle is in a tilted position..

5. When cooking is completed turn On/Off Switch/Solid State Temperature Control (**2**) to the "OFF' position.

**NOTE:** A five minute complete shut-of period is required before relighting.

6. Pour the contents of the kettle into an appropriate container by tilting the kettle forward. Care should be taken to pour slowly enough to avoid splashing off the product.

**NOTE:** As with cleaning food soil from any cookware, an important part of kettle cleaning is to prevent food from drying on. For this reason, cleaning should be completed immediately after cooked foods are removed. Refer to the Cleaning Instructions for detailed kettle washing procedures.

# APPROXIMATE BOILING TIMES

The accompanying chart shows approximate times required for gas kettles of various capacities to boil water with the lid open. The ON/OFF Switch/Solid State Temperature Control (**2**) must be set at "**10**" throughout the heat-up period. Water will boil about 1/3 faster if the kettle is filled only to the outer steam jacket's welded seam resulting in a kettle filled to 2/3 capacity.

| Kettle Capacity | Minutes |
|---|---|
| ***KGL, KGL-T*** | |
| 40 gallon | 35 |
| 60 gallon | 47 |
| 80 gallon | 60 |
| 100 gallon | 75 |
| ***KGL-SH, KGL-TSH*** | |
| 60 gallon | 27 |
| 80 gallon | 34 |

Approximate Boiling Times

# CLEANING INSTRUCTIONS


## CARE AND CLEANING

Cooking equipment must be cleaned regularly to maintain its fast, efficient cooking performance and to ensure its continued safe, reliable operation. The best time to clean is shortly after each use (allow unit to cool to a safe temperature).

## WARNINGS

⇨ 

**Chloride Cleaners**

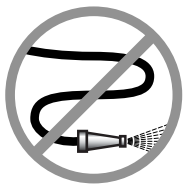
Do not use detergents or cleansers that are chloride based or contain quaternary salt.

⇨ 
**Wire Brush &**

Do not use a metal bristle brush or scraper.

⇨ 
**Steel Pads**

Steel wool should never be used for cleaning the stainless steel.

⇨ 
**High Pressure Spray Hose**

Unit should never be cleaned with a high pressure spray hose.

⇨ 
**Stagnant Water**

Do not leave water sitting in unit when not in use.

## CLEANING INSTRUCTIONS

1. Turn unit off.
2. Remove drain screen (if applicable). Thoroughly wash and rinse the screen either in a sink or a dishwasher.
3. Prepare a warm water and mild detergent solution in the unit.
4. Remove food soil using a nylon brush.
5. Loosen food which is stuck by allowing it to soak at a low temperature setting.
6. Drain unit.
7. Rinse interior thoroughly.
8. If the unit is equipped with a Tangent Draw-Off Valve, clean as follows:
   - **a)** Disassemble the draw-off valve first by turning the valve knob counter-clockwise, then turning the large hex nut counter-clockwise until the valve stem is free of the valve body.
   - **b)** In a sink, wash and rinse the inside of the valve body using a nylon brush.
   - **c)** Use a nylon brush to clean tangent draw-off tube.
   - **d)** Rinse with fresh water.
   - **e)** Reassemble the draw-off valve by reversing the procedure for disassembly. The valve's hex nut should be hand tight only.
9. If the unit is equipped with a Butterfly Valve, clean as follows:
   - **a)** Place valve in open position.
   - **b)** Wash using a warm water and mild detergent solution.
   - **c)** Remove food deposits using a nylon brush.
   - **d)** Rinse with fresh water.
   - **e)** Leave valve open when unit is not in use.
10. Using mild soapy water and a damp sponge, wash the exterior, rinse, and dry.

### NOTES

⇨ For more difficult cleaning applications one of the following can be used: alcohol, baking soda, vinegar, or a solution of ammonia in water.

⇨ Leave the cover off when the kettle is not in use.

⇨ For more detailed instructions refer to the Nafem Stainless Steel Equipment Care and Cleaning manual (supplied with unit).

# STAINLESS STEEL EQUIPMENT CARE AND CLEANING

(Supplied courtesy of Nafem. For more information visit their web site at www.nafem.org)

**Contrary to popular belief, stainless steels ARE susceptible to rusting.**

Corrosion on metals is everywhere. It is recognized quickly on iron and steel as unsightly yellow/orange rust. Such metals are called "active" because they actively corrode in a natural environment when their atoms combine with oxygen to form rust.

Stainless steels are passive metals because they contain other metals, like chromium, nickel and manganese that stabilize the atoms. 400 series stainless steels are called ferritic, contain chromium, and are magnetic; 300 series stainless steels are called austenitic, contain chromium and nickel; and 200 series stainless, also austenitic, contains manganese, nitrogen and carbon. Austenitic types of stainless are not magnetic, and generally provide greater resistance to corrosion than ferritic types.

With 12-30 percent chromium, an invisible passive film covers the steel's surface acting as a shield against corrosion. As long as the film is intact and not broken or contaminated, the metal is passive and stain-less. If the passive film of stainless steel has been broken, equipment starts to corrode. At its end, it rusts.

**Enemies of Stainless Steel**

There are three basic things which can break down stainless steel's passivity layer and allow corrosion to occur.

1. Mechanical abrasion
2. Deposits and water
3. Chlorides

**Mechanical abrasion** means those things that will scratch a steel surface. Steel pads, wire brushes and scrapers are prime examples.

**Water** comes out of the faucet in varying degrees of hardness. Depending on what part of the country you live in, you may have hard or soft water. Hard water may leave spots, and when heated leave deposits behind that if left to sit, will break down the passive layer and rust stainless steel. Other deposits from food preparation and service must be properly removed.

**Chlorides** are found nearly everywhere. They are in water, food and table salt. One of the worst chloride perpetrators can come from household and industrial cleaners.

**So what does all this mean? Don't Despair!**

Here are a few steps that can help prevent stainless steel rust.

1. *Use the proper tools.*

   When cleaning stainless steel products, use non-abrasive tools. Soft cloths and plastic scouring pads will not harm steel's passive layer. Stainless steel pads also can be used but the scrubbing motion must be in the direction of the manufacturers' polishing marks.

2. *Clean with the polish lines.*

   Some stainless steel comes with visible polishing lines or "grain." When visible lines are present, always scrub in a motion parallel to the lines. When the grain cannot be seen, play it safe and use a soft cloth or plastic scouring pad.

3. *Use alkaline, alkaline chlorinated or non-chloride containing cleaners.*

   While many traditional cleaners are loaded with chlorides, the industry is providing an ever-increasing choice of non-chloride cleaners. If you are not sure of chloride content in the cleaner used, contact your cleaner supplier. If your present cleaner contains chlorides, ask your supplier if they have an alternative. Avoid cleaners containing quaternary salts; it also can attack stainless steel and cause pitting and rusting.

4. *Treat your water.*

   Though this is not always practical, softening hard water can do much to reduce deposits. There are certain filters that can be installed to remove distasteful and corrosive elements. To insure proper water treatment, call a treatment specialist.

5. *Keep your food equipment clean.*

   Use alkaline, alkaline chlorinated or non-chloride cleaners at recommended strength. Clean frequently to avoid build-up of hard, stubborn stains. If you boil water in stainless steel equipment, remember the single most likely cause of damage is chlorides in the water. Heating cleaners that contain chlorides have a similar effect.

6. *Rinse, rinse, rinse.*

   If chlorinated cleaners are used, rinse and wipe equipment and supplies dry immediately. The sooner you wipe off standing water, especially when it contains cleaning agents, the better. After wiping equipment down, allow it to air dry; oxygen helps maintain the stainless steel's passivity film.

7. *Never use hydrochloric acid (muriatic acid) on stainless steel.*
8. *Regularly restore/passivate stainless steel.*

**Recommended cleaners for specific situations**

| Job | Cleaning Agent | Comments |
|---|---|---|
| Routine cleaning | Soap, ammonia, detergent, Medallion | Apply with cloth or sponge |
| Fingerprints & smears | Arcal 20, Lac-O-Nu Ecoshine | Provides barrier film |
| Stubborn stains & discoloration | Cameo, Talc, Zud, First Impression | Rub in direction of polish lines |
| Grease & fatty acids, blood, burnt-on-foods | Easy-off, De-Grease It Oven Aid | Excellent removal on all finishes |
| Grease & oil | Any good commercial detergent | Apply with sponge or cloth |
| Restoration/Passivation | Benefit, Super Sheen | |

**Review**

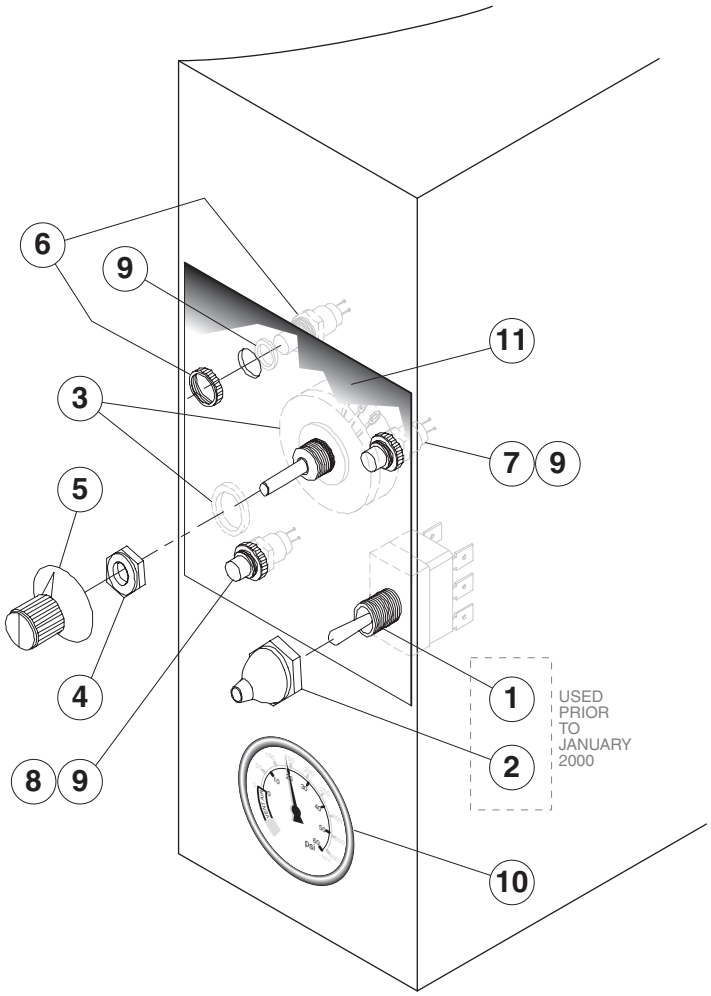
1. Stainless steels rust when passivity (film-shield) breaks down as a result of scrapes, scratches, deposits and chlorides.
2. Stainless steel rust starts with pits and cracks.
3. Use the proper tools. Do not use steel pads, wire brushes or scrapers to clean stainless steel.
4. Use non-chlorinated cleaners at recommended concentrations. Use only chloride- free cleaners.
5. Soften your water. Use filters and softeners whenever possible.
6. Wipe off cleaning agent(s) and standing water as soon as possible. Prolonged contact causes eventual problems.

To learn more about chloride-stress corrosion and how to prevent it, contact the equipment manufacturer or cleaning materials supplier.

Developed by Packer Engineering, Naperville, Ill., an independent testing laboratory.

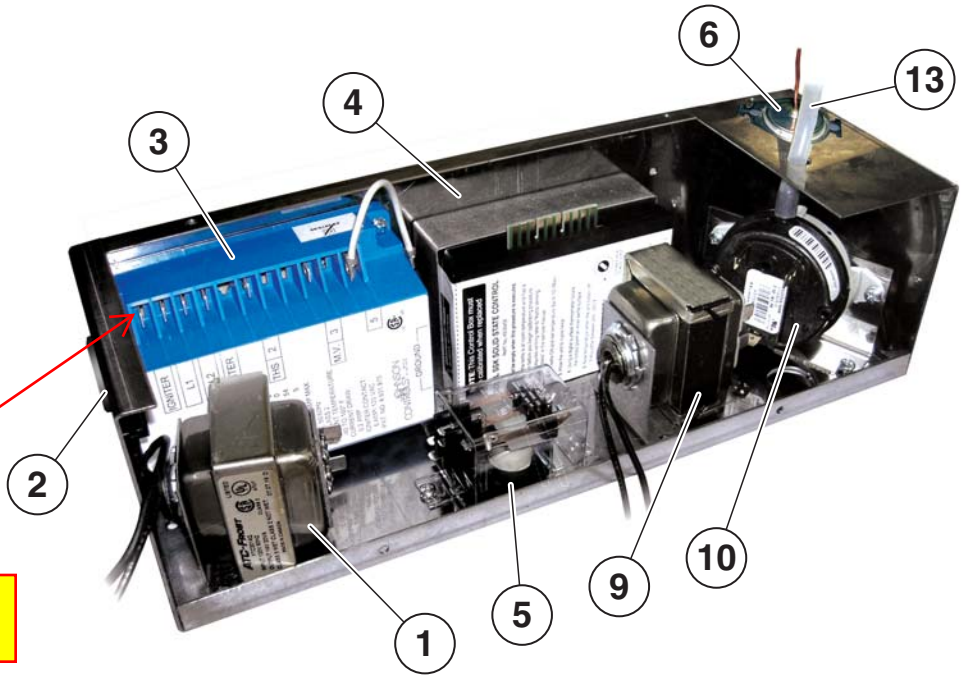
# SERVICE PARTS

## CONSOLE CONTROLS




| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE50504 | SWITCH, TOGGLE (USED PRIOR TO JANUARY 2000) | 1 |
| 2. | SK50062 | RUBBER BOOT (USED PRIOR TO JANUARY 2000) | 1 |
| 3. | SE00114 | POTENTIOMETER WITH ON/OFF SWITCH, C/W ITEM #4 | 1 |
| | KE50988-2 | POTENTIOMETER (USED PRIOR TO JANUARY 2000) | 1 |
| 4. | KE51005 | RUBBER BOOT | 1 |
| 5. | KE50569-1 | KNOB, POTENTIOMETER | 1 |
| 6. | SE003013-1 | L.E.D., RED, Replacement Kit., (includes LED & "O" Ring) | 1 |
| 7. | SE003013-2 | L.E.D., GREEN, Replacement Kit., (includes LED & "O" Ring) | 1 |
| 8. | SE003013-3 | L.E.D., AMBER (Used prior to July 2004), Replacement Kit., (includes LED & "O" Ring) | 1 |
| 9. | FA05002-18 | "O" RING | 3 |
| 10. | KE50429-2 | PRESSURE GAUGE | 1 |
| 11. | KE95555-5 | LABEL | 1 |
| | | ~~LABEL (USED PRIOR TO JANUARY 2000)~~ | 1 |

# ELECTRICAL COMPONENT BOX

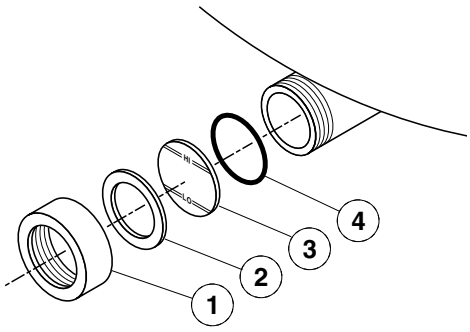



New Module Kit KE003660
After 4-2010 KE53469-5

| ITEM ON. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| | KE01422 | ELECTRICAL CONTROL BOX ASSEMBLY | 1 |
| | KE53439 | COMPONENT BOX | 1 |
| | KE53440 | COVER, COMPONENT BOX | 1 |
| | KE53599-1 | GASKET | 1 |
| 1. | KE53838-27 | TRANSFORMER, 120-14V. | 1 |
| | KE53444 | TRANSFORMER BRACKET | 1 |
| 2. | KE54833-3 | SNAP-IN BUSHING, 0.875" DIA. | 1 |
| 3. | ~~KE02372~~ | IGNITION MODULE, PRIOR TO SEPT. 2004 | 1 |
| | ~~KE53469-4~~ | IGNITION MODULE, SEPT. 2004 AND AFTER | 1 |
| 4. | KE00458-1 | KETTLE SOLID STATE CONTROL BOX | 1 |
| | KE50303 | BRACKET, SOLID STATE CONTROL BOX | 1 |
| 5. | KE50753-7 | RELAY, 12V SPDT (FOR 60 CYCLE, 120V UNITS) | 1 |
| | KE50753-8 | RELAY, 12V DPDT (FOR 50 CYCLE, 240V UNITS) | 1 |
| 6. | KE55069-9 | SAFETY THERMOSTAT | 1 |
| 7. | FI05050 | BRASS NUT, 7/16-24, PRIOR TO SEPT. 2004 | 1 |
| 10. | KE02400 | AIR SWITCH, PRIOR TO SEPT. 2004 | 1 |
| | KE55453 | AIR SWITCH, SEPT. 2004 AND AFTER | 1 |
| 9. | KE53838-20 | TRANSFORMER 120-24V 20 VA | 1 |
| 13. | KE53582 | TUBING 1/4 INCH SILICONE | |
| Not Shown | KE53523 | TUBING 1/4 INCH COPPER, PRIOR TO SEPT. 2004 | |

# SIGHT GLASS

| ITEM ON. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE50955 | RETAINING COVER | 1 |
| 2. | KE52871 | GASKET | 1 |
| 3. | KE51053 | SIGHT GLASS | 1 |
| 4. | FA05002-30 | "O" RING | 1 |



Partspin®


# Cleveland KE53440 COVER COMP BOX (KGL/-T]

Real OEM Part

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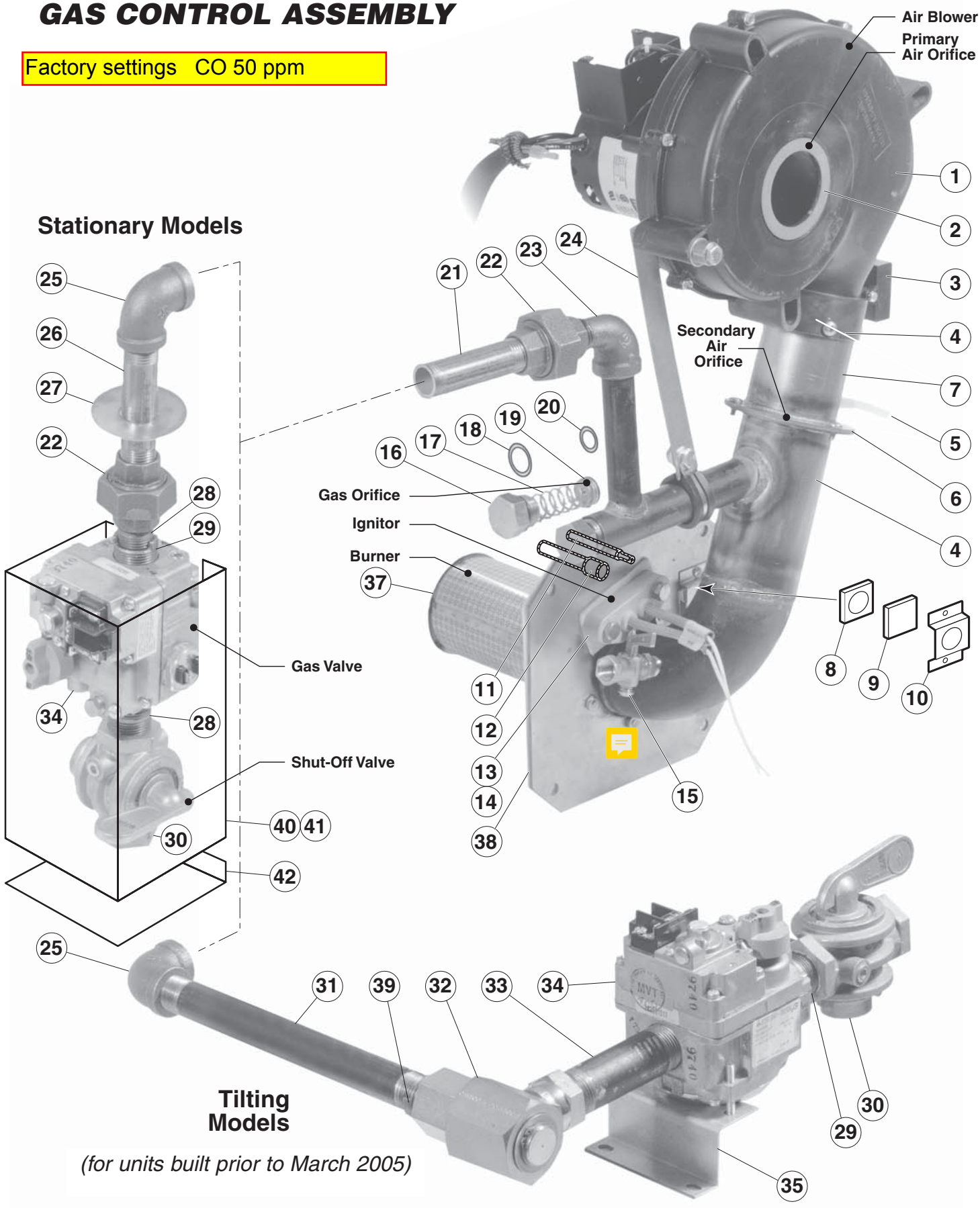
|---|---|
| Quantity Available: | 4 |
| Manufacturer: | Cleveland |
| Manufacturer #: | KE53440 |
| Parts Town Part #: | CLEKE53440 |
| Units: | Each |
| Fits Models: | View Models List |
| California Residents: | Proposition 65 Warning |

# GAS CONTROL ASSEMBLY

Factory settings CO 50 ppm



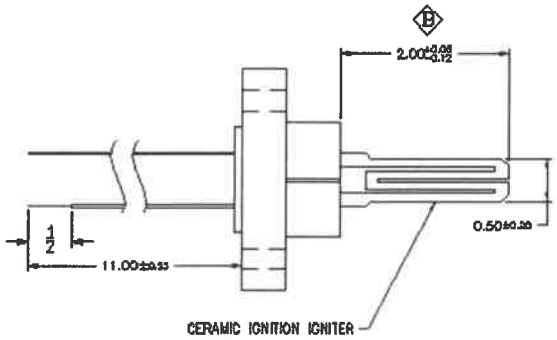

## Stationary Models

## Tilting Models

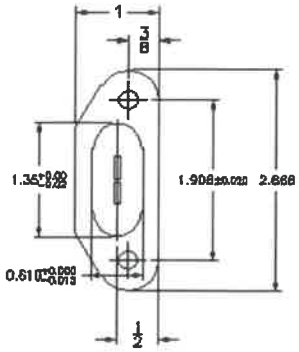
*(for units built prior to March 2005)*

# GAS CONTROL ASSEMBLY

| ITEM ON. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE53441 | BLOWER, 115V, 60 HZ | 1 |
| | KE53441-1 | BLOWER, 220V, 50 HZ | 1 |
| 2. | KE54420 | AIR INTAKE WASHER (NATURAL GAS) | 1 |
| | KE54420-1 | AIR INTAKE WASHER (PROPANE) | 1 |
| 3. | KE54239 | CAPACITOR | 1 |
| 4. | KE01426-4 | MIXING CHAMBER, 40 GALLON KETTLES | 1 |
| | KE01426-1 | MIXING CHAMBER, 60 GALLON KETTLES | 1 |
| | KE01426-2 | MIXING CHAMBER, 80 GALLON KETTLES | 1 |
| | KE01426-3 | MIXING CHAMBER, 100 GALLON KETTLES | 1 |
| 5. | KE53582 | TUBING 1/4 INCH SILICONE | 1 |
| | FI05156 | HOSE FITTING | 1 |
| 6. | KE53402 | AIR ORIFICE, 40 GALLON KETTLES | 1 |
| | KE53402-1 | AIR ORIFICE, 60 - 100 GALLON KETTLES | 1 |
| | KE53402-2 | AIR ORIFICE, 40 GALLON KETTLES (50 HZ BLOWER) | 1 |
| | KE53402-3 | AIR ORIFICE, 60 - 100 GALLON KETTLES (50 HZ BLOWER) | 1 |
| 7. | KE01449 | BLOWER MOUNTING PIPE ASSEMBLY | 1 |
| 8. | KE53618 | SIGHT GLASS GASKET | 1 |
| 9. | KE53617 | SIGHT GLASS | 1 |
| 10. | KE53619 | SIGHT GLASS RETAINER | 1 |
| 11. | KE003868 | THERMISTOR | 1 |
| 12. | KE50556-2 | WATER LEVEL PROBE | 1 |
| 13. | KE53437-3 | IGNITOR | 1 |
| 14. | KE53570 | GASKET FOR IGNITOR | 1 |
| 15. | FI05257 | SHUT-OFF COCK | 1 |
| 16. | FI05213 | PLUG | 1 |
| 17. | KE53422 | SPRING | 1 |
| 18. | FA05002-4 | “O” RING | 1 |
| 19. | ***GAS ORIFICES:*** | | |
| | KE53403-8 | NATURAL GAS - SEA LEVEL UP TO 2000', 40 GALLON KETTLES | 1 |
| | KE53403-5 | PROPANE GAS - SEA LEVEL UP TO 2000', 40 GALLON KETTLES | 1 |
| | KE53403-6 | NATURAL GAS - SEA LEVEL UP TO 2000', 60 - 100 GALLON KETTLES | 1 |
| | KE53403-7 | PROPANE GAS - SEA LEVEL UP TO 2000', 60 - 100 GALLON KETTLES | 1 |
| | KE53403-8 | NATURAL GAS - 2000' UP TO 4000', 40 GALLON KETTLES | 1 |
| | KE53403-9 | PROPANE GAS - 2000' UP TO 4000', 40 GALLON KETTLES | 1 |
| | KE53403-10 | NATURAL GAS - 2000' UP TO 4000', 60 - 100 GALLON KETTLES | 1 |
| | KE53403-11 | PROPANE GAS - 2000' TO 4000', 60 - 100 GALLON KETTLES | 1 |
| | KE53403-12 | NATURAL GAS - 4000' UP TO 6000', 40 GALLON KETTLES | 1 |
| | KE53403-13 | PROPANE GAS - 4000' UP TO 6000', 40 GALLON KETTLES | 1 |
| | KE53403-10 | NATURAL GAS - 4000' UP TO 6000', 60 - 100 GALLON KETTLES | 1 |
| | KE53403-14 | PROPANE GAS - 4000' UP TO 6000', 60 - 100 GALLON KETTLES | 1 |
| 20. | FA05002-29 | “O” RING | 1 |
| 21. | FI05226-4 | NIPPLE, 1/2" NPT, 5 5/16" LONG | 1 |
| 22. | FI00073 | UNION, 1/2" | 1 |
| 23. | FI00133 | ELBOW, 1/2", STREET | 1 |
| 24. | KE93909 | STRIP, TO HOLD BLOWER DOWN | 1 |
| 25. | FI00040-1 | ELBOW, 1/2" | 1 |
| 26. | FI00579 | NIPPLE, 1/2" NPT, 4" LONG, KGL-60-T | 1 |
| | FI05226-2 | NIPPLE, 1/2" NPT, 4" LONG, KGL-80-T | 1 |
| 27. | KE55004-3 | RETAINING PLATE | 1 |
| 28. | FI00573 | NIPPLE, 1/2" NPT, 1 1/8" LONG | 1 |
| 29. | FI05231 | BUSHING, 3/4 - 1/2" NPT FLUSH, BLACK IRON | 1 |
| 30. | F01518-1 | GAS SHUT-OFF VALVE, 3/4" (NOT FOR FRENCH CE KETTLES) | 1 |
| 31. | FI05226 | NIPPLE, 1/2" NPT, 8" LONG | 1 |
| 32. | FI05222 | SWIVEL ELBOW | 1 |
| 33. | FI05223 | SPECIAL NIPPLE | 1 |
| 34. | KE02053 | GAS VALVE ASSEMBLY | 1 |
| 35. | KE53390 | BRACKET FOR GAS VALVE | 1 |
| 36. | FI00607 | NIPPLE, 3/4" NPT, 1 1/2" LONG | 1 |
| 37. | KE01500-5 | BURNER, 40 GALLON KETTLES, 140,000 BTU KE01500 40 gallon before 2001 | 1 |
| | KE01500-1 | BURNER, 60-100 GALLON KETTLES, 190,000 BTU | 1 |
| 38. | KE53397 | GASKET, BURNER | 1 |
| 39. | FI05231 | ADAPTOR | 1 |
| 40. | KE601085 | COVER FOR GAS VALVE | 1 |
| 41. | RB018151 | GASKET FOR COVER | 1 |
| 42. | KE601081 | BRACKET | 1 |




KE53437-3 REV A

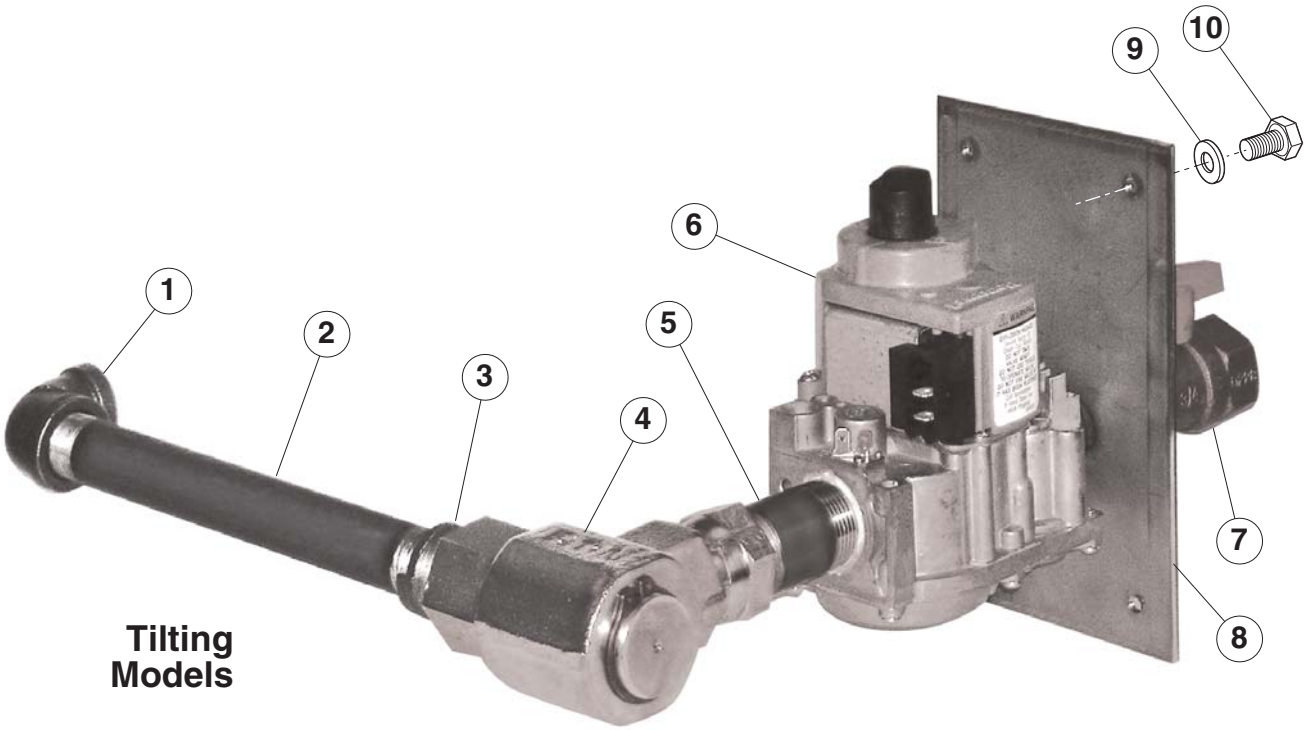



SUPPLIED AND MANUFACTURED BY NORTON IGNITER PRODUCTS
MANUFACTURE # 201Y
MANUFACTURER PART # MB478614 A

**NEW IGNITOR WILL OHM OUT AT ABOUT 161 OHMS.**

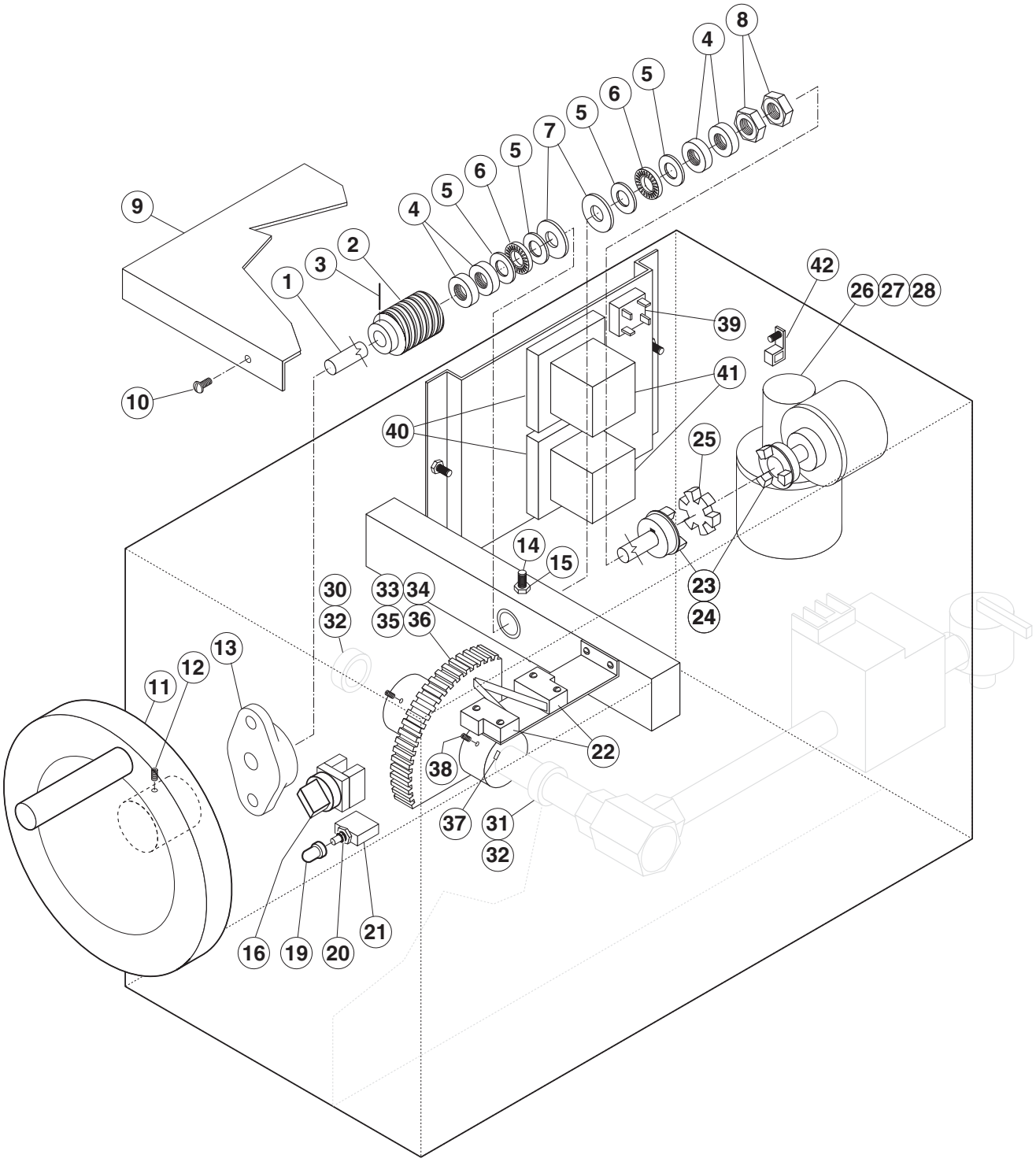
# *GAS CONTROL ASSEMBLY*

*(for units built after February 2005)*




| | | | |
|---|---|---|---|
| 1. | FI00040-1 | ELBOW, 1/2" | 1 |
| 2. | FI05226 | NIPPLE, 1/2" NPT, 8" LONG | 1 |
| 3. | FI05231 | ADAPTOR | 1 |
| 4. | FI05222 | SWIVEL ELBOW | 1 |
| 5. | FI05223 | SPECIAL NIPPLE | 1 |
| 6. | KE55240R | GAS VALVE | 1 |
| 7. | F015 | GAS SHUT-OFF VALVE, 3/4" | 1 |
| 8. | KE000960 | NIPPLE PLATE WELDMENT | 1 |
| 9. | FA30505-1 | WASHER, 1/4" | 4 |
| 10. | FA11256 | HEX BOLT, 1/4-20 X 1/2, 18-8 SS | 4 |

# *GEARBOX ASSEMBLY*



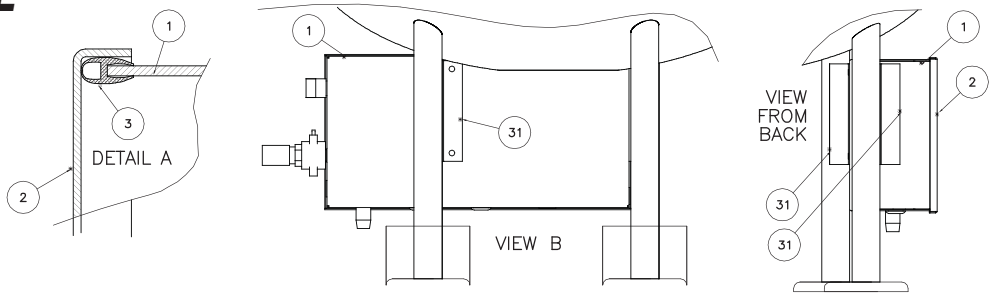
# GEARBOX ASSEMBLY

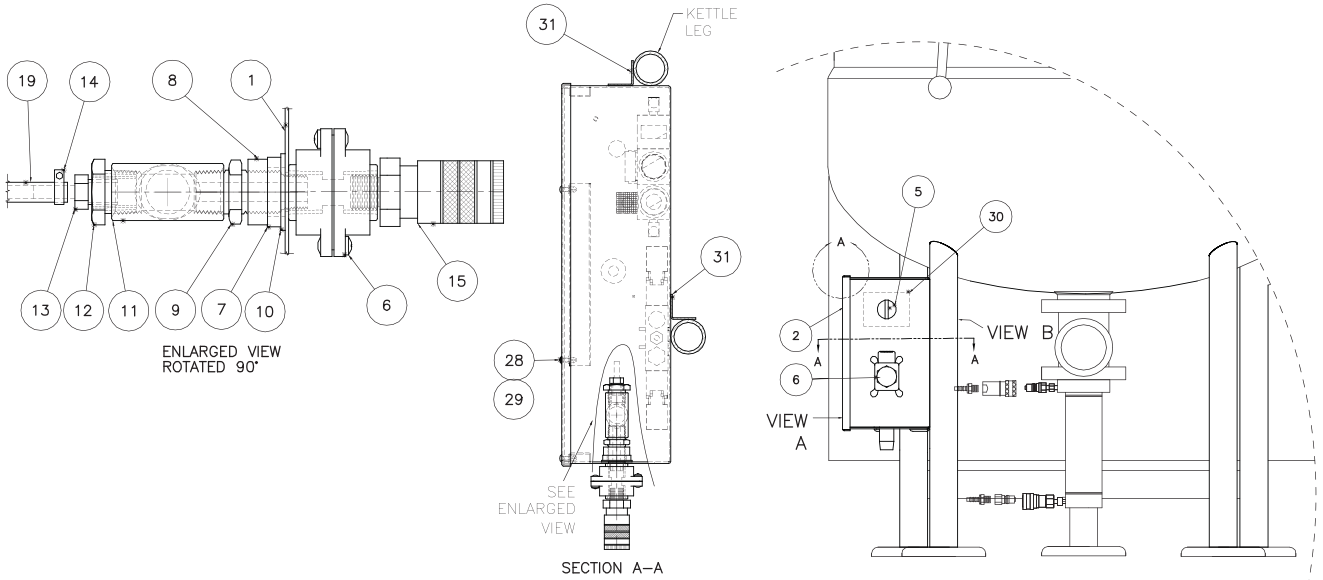
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE52836-2 | TILT SHAFT | 1 |
| 2. | KE50315 | WORM | 1 |
| 3. | FA95005 | TENSION PIN | 1 |
| 4. | KE52193 | THRUST BEARING SPACER | 2 |
| 5. | KE52192 | THRUST WASHER | 4 |
| 6. | KE52191 | ROLLER BEARING | 2 |
| 7. | FA30088 | WASHER | 2 |
| 8. | FA95008 | JAM NUTS | 2 |
| 9. | KE55057-4 | LID FOR GEARBOX | 1 |
| 10. | FA95062 | PAN HD. PHILLIPS SCREW | 2 |
| 11. | KE00508 | HANDWHEEL ASSEMBLY | 1 |
| 12. | FA19501 | HANDWHEEL ALLEN SCREW, HEX SOCKET | 2 |
| 13. | KE51730 | TILT SHAFT BEARING | 4 |
| 14. | FA19177 | HEX SOCKET SET SCREW 5/16-24 X 1/2 | 1 |
| 15. | FA20047 | JAM NUT 5/16-24 | 1 |
| 16. | KE003209-11 | Complete Switch | 1 |
| | KE603208-4 | Momentary Switch Activator*** | 1 |
| | KE603208-7 | Contact Section Holder, Latch*** | 1 |
| | KE603208-9 | Contact Block*** | 4 |
| | ***NOTE: for units built prior to Dec. 2006 order Complete Switch KE003209-11 | | |
| 19. | KE50580 | WATER RESISTANT BOOT | 1 |
| 20. | FA00012 | "O" RING, CIRCUIT BREAKER | 1 |
| 21. | KE50579-1 | CIRCUIT BREAKER | 1 |
| 22. | KE51007 | MICRO SWITCH | 2 |
| | FA10139 | MACHINE SCREW #6-32 X 1" LG | 4 |
| | KE50498 | MICRO SWITCH INSULATION | 2 |
| | FA32004 | TOOTH LOCK WASHER #6 | 4 |
| 23. | KE50582 | CPLG. ONTARIO BELTING #G-100 5/8 BORE | 2 |
| 24. | FA95014 | SQUARE KEY 3/16 X 3/16 X 1" LG | 1 |
| 25. | KE50583 | RUBBER INSERT, ONTARIO BELTING "BUNA N" | 1 |
| 26. | KE52832-1 | MOTOR | 1 |
| 27. | FA10487 | HEX HD SCREW 1/4-20 X 1" LG | 4 |
| 28. | FA31008 | SPLIT LOCKWASHER 1/4" DIA | 4 |
| 29. | FA20026 | HEX NUT 1/4 - 20 | 4 |
| 30. | KE517112 | LEFT HAND BEARING | 1 |
| 31. | KE517111 | RIGHT HAND BEARING | 1 |
| 32. | KE51712 | GREASE NIPPLE | 2 |
| 33. | KE01889 | MICRO SWITCH TRIGGER/WORM GEAR WELDMENT | 1 |
| 34. | FA10772 | SOCKET HD. CAP SCREW | 2 |
| 35. | FA20048 | JAM NUT | 2 |
| 36. | FA95050 | RETAINING RING | 1 |
| 37. | FA95055-1 | SQUARE KEY | 1 |
| 38. | FA19201 | HEX SOCKET SET SCREW 3/8-24 | 1 |
| 39. | KE50581 | BRIDGE RECTIFIER | 1 |
| 40. | KE54535 | EDGE CONNECTOR (11 PIN) | 2 |
| 41. | KE50753-10 | RELAY | 2 |
| 42. | KE50473 | GROUND LUG | 1 |

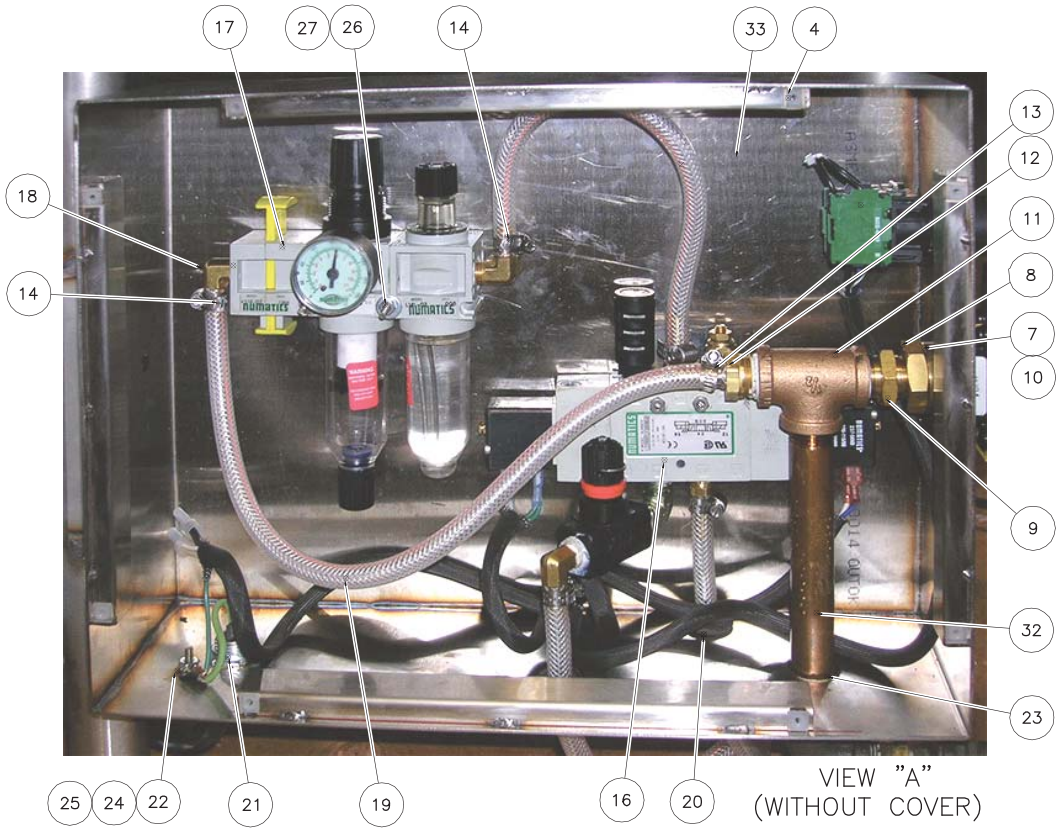
# PNEUMATIC BOX ASSEMBLY

## (FOR OPTIONAL FLUSH PISTON VALVE)

*(USED AFTER 2003)*



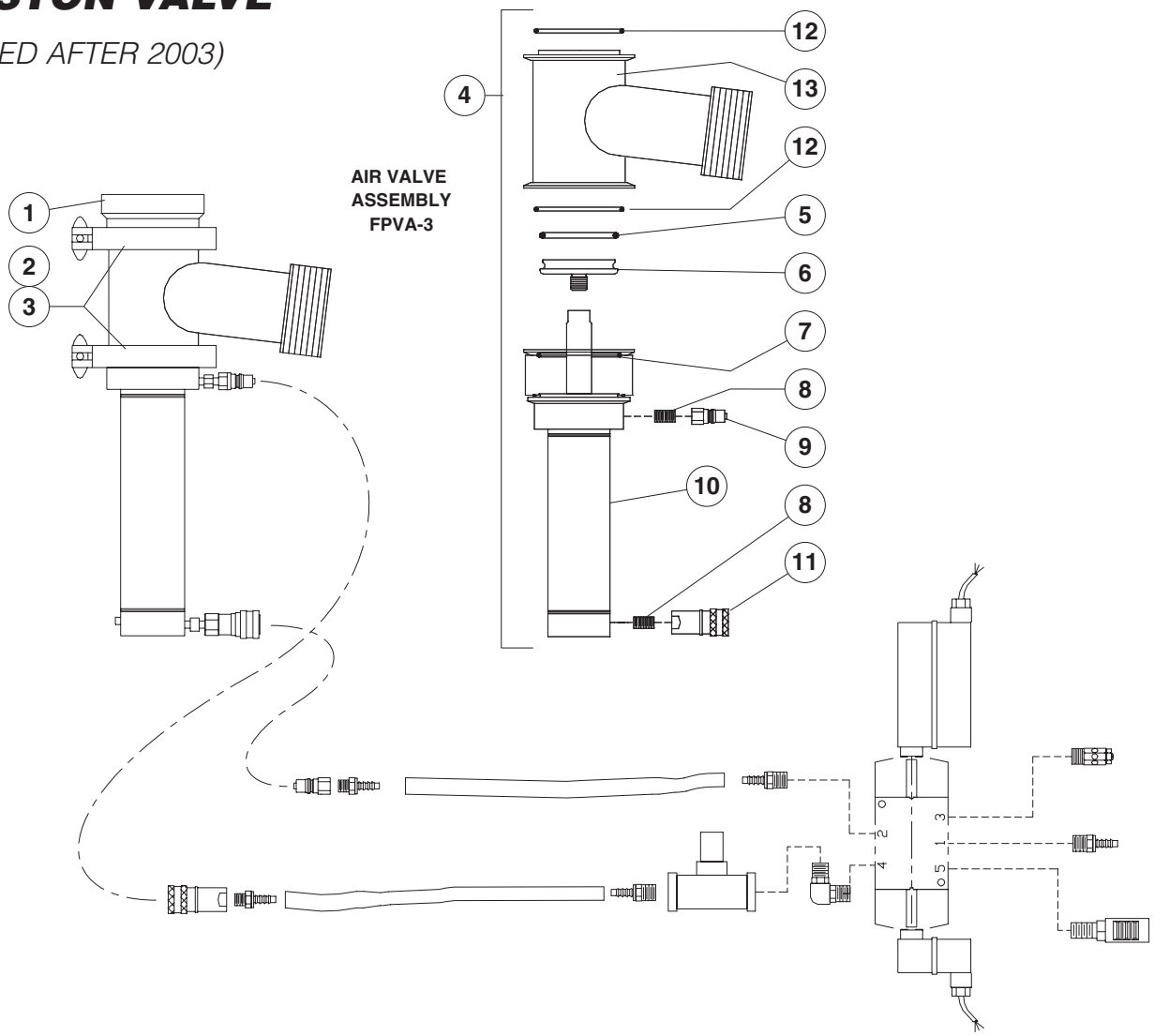
# *PNEUMATIC BOX ASSEMBLY (FOR OPTIONAL FLUSH PISTON VALVE)*

*(USED AFTER 2003)*

| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE003050 | PNEUMATIC BOX WLD'T; KGL/T | 1 |
| 2. | KE602957 | COVER; PNEUMATIC BOX | 1 |
| 3. | KE54846-9 | GASKET;PNEUMATIC BOX | 1 |
| 4. | FA95074 | ANCHOR NUT; NYLON | 8 |
| 5. | KE01812-1 | (USE KE003209-9 SWITCH)7 | 1 |
| | KE003209-9 | SWITCH; ON/OFF/ON | 1 |
| 6. | KE601601 | SLIDE VALVE; PNEUMATICS | 1 |
| 7. | KE602960 | SPACER | 1 |
| 8. | KE52697 | LOCKNUT; 1/2" NPS (KDT) | 1 |
| 9. | KE601602 | AIR FITTING; PNEUMATICS | 1 |
| 10. | FA32500 | LOCKWASHER; 7/8" INT. TOOTH | 1 |
| 11. | KE600814-1 | TEE; 1/2" BRASS ANSI B16.15 | 1 |
| 12. | FI00351 | BUSHING; 1/2" X 1/4" HEX BRASS | 1 |
| 13. | FI05317-2 | HOSE BARB; 1/4 X 1/4 | 1 |
| 14. | FI05220-1 | HOSE CLAMP; MAH-4 | 3 |
| 15. | KE601603 | QUICK CONNECT; MCMASTER | 1 |
| 16. | KE02292-1 | AIR SOLENOID ASS'Y; FPVA-3 | 1 |
| 17. | KE02369 | FILTER-REGULATOR ASS'Y. | 1 |
| 18. | FI05318 | ELBOW; HOSE BARB 90D | 2 |
| 19. | KE532176 | HOSE; 1/4 ID, 12.5" | 1 |
| 20. | KE50555-3 | RUBBER GROMMET;13/16 HOLE | 2 |
| 21. | KE51238-1 | CONNECTOR; 1/2" 2 SCREWS | 1 |
| 22. | KE50473 | GROUND LUG; ILSCO #SLU-35 | 1 |
| 23. | KE55004-3 | RETAINING PLATE; KGL/-T | 1 |
| 24. | FA21006 | HEX NUT; 10-24 18-8 S.S. | 1 |
| 25. | WC101655 | WASHER; FLAT #10 S.S | 1 |
| 26. | FA21002 | HEX NUT; #6-32 18-8 S.S. | 4 |
| 27. | FA32004 | LOCKWASHER; #6 EXT. TOOTH | 4 |
| 28. | FA11091 | SCREW;PHILIPS 8-32 X 3/8"L | 8 |
| 29. | KE55242 | SEALING WASHER | 8 |
| 30. | KE95481-5 | LABEL; PRODUCT DISCHARGE | 1 |
| 31. | KE602071 | ANGLE | 2 |
| 32. | N0440B4 | NIPPLE;1/2 X 4 BRASS | 1 |
| 33. | KE55232 | WIRING DIAG.; FPVA-3 | 1 |

# *OPTIONAL FLUSH PISTON VALVE*

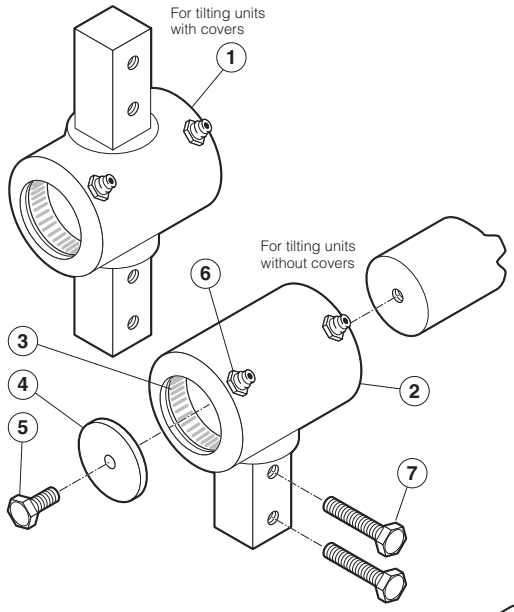
*(USED AFTER 2003)*



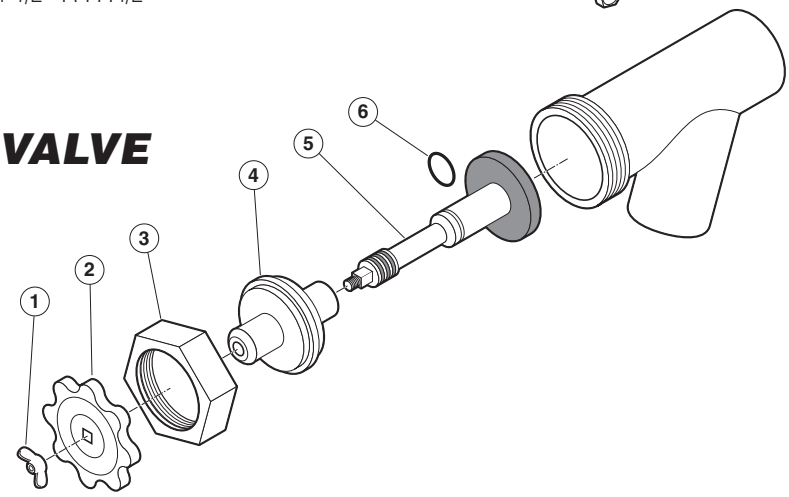

| *ITEM ON.* | *PART NO.* | *DESCRIPTION* | *QTY.* |
|---|---|---|---|
| 1. | KE55210 | WELD RING, KETTLE BOTTOM OUTLET | 1 |
| 2. | FI05144-3 | SANI CLAMP, 3” | 2 |
| 3. | KE52154-4 | GASKET, SANI CLAMP, 3” | 2 |
| 4. | KE02291 | COMPLETE ACTUATOR AND DISCHARGE VALVE ASSEMBLY *INCLUDES PARTS 5. - 13.* | 1 |
| 5. | KE55248 | BUNA-N O-RING | 1 |
| 6. | KE55249 | REPLACEABLE S.S. PLUNGER HEAD | 1 |
| 7. | KE55250 | BUNA-N O-RING | 1 |
| 8. | KE55251 | 1/8 NPT S.S. HYDRAULIC CLOSE NIPPLE | 2 |
| 9. | KE55252 | MALE S.S. QUICK DISCONNECT | 1 |
| 10. | KE55253 | AIR OPERATED CYLINDER | 1 |
| 11. | KE55254 | FEMALE S.S. QUICK DISCONNECT | 1 |
| 12. | KE55255 | BUNA-N O-RING | 2 |
| 13. | KE55256 | FEMALE S.S. QUICK DISCONNECT | 1 |

# TRUNNION ASSEMBLY

| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1. | KE00354 | TRUNNION BEARING ASSEMBLY (INCLUDES PART # 3 & 6) | 1 |
| 2. | KE00351 | TRUNNION BEARING ASSEMBLY (INCLUDES PART # 3 & 6) | 1 |
| 3. | KE51711 | ROLLER BEARING | 2 |
| 4. | KE50666 | SPHERICAL WASHER | 1 |
| 5. | FA95081-3 | BOLT, 5/16-18 X 1/2" | 1 |
| 6. | KE51886 | GREASE NIPPLE | 2 |
| 7. | FA95027 | MODIFIED BOLT, 5/16-18 X 1 1/2" | 4/2 |

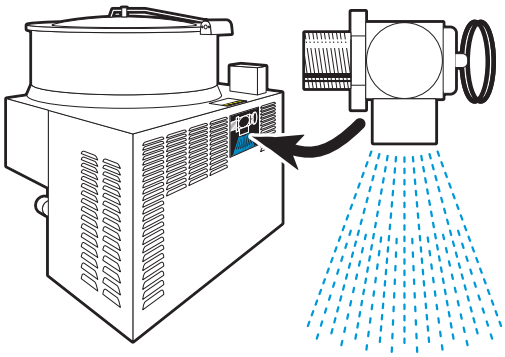


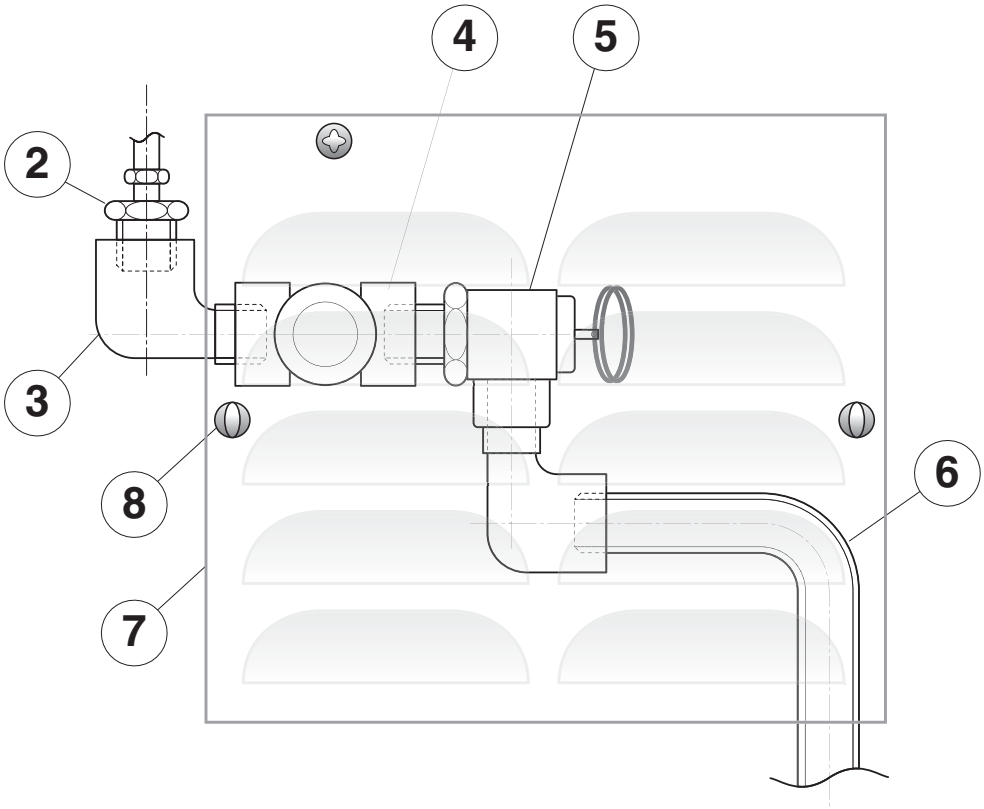

# TANGENT DRAW-OFF VALVE




| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| Complete Valve | KE50972-B | 2" DRAW-OFF ASSEMBLY (TD-2) | 1 |
| | KE50973 | 3" DRAW-OFF ASSEMBLY (TD-3) | 1 |
| | KE02044-2 | 2" DRAW-OFF ASSEMBLY (TD-2A with ACME THREAD) | 1 |
| | KE02044-4 | 3" DRAW-OFF ASSEMBLY (TD-3A with ACME THREAD) | 1 |
| 1. | FA95049 | WING NUT, TD-2 | 1 |
| | FA21050 | ACCORN NUT, TD-2 | 1 |
| | FA21501-1 | ACCORN NUT, TD-3 | 1 |
| 2. | KE52755 | KNOB, TD-2 | 1 |
| | SE50018 | KNOB, TD-3 | 1 |
| 3. | FI05180-1 | HEX NUT, TD-2 | 1 |
| | FI05180-2 | HEX NUT, TD-3 | 1 |
| 4. | KE52753 | RETAINER, TD-2 | 1 |
| | SE50013 | RETAINER, TD-3 | 1 |
| 5. | KE52752 | PISTON, TD-2 | 1 |
| | SE50010 | PISTON, TD-3 | 1 |
| 6. | FA05002-24 | "O" RING, TD-2 | 1 |
| | FA05002-38 | "O" RING, TD-3 | 1 |

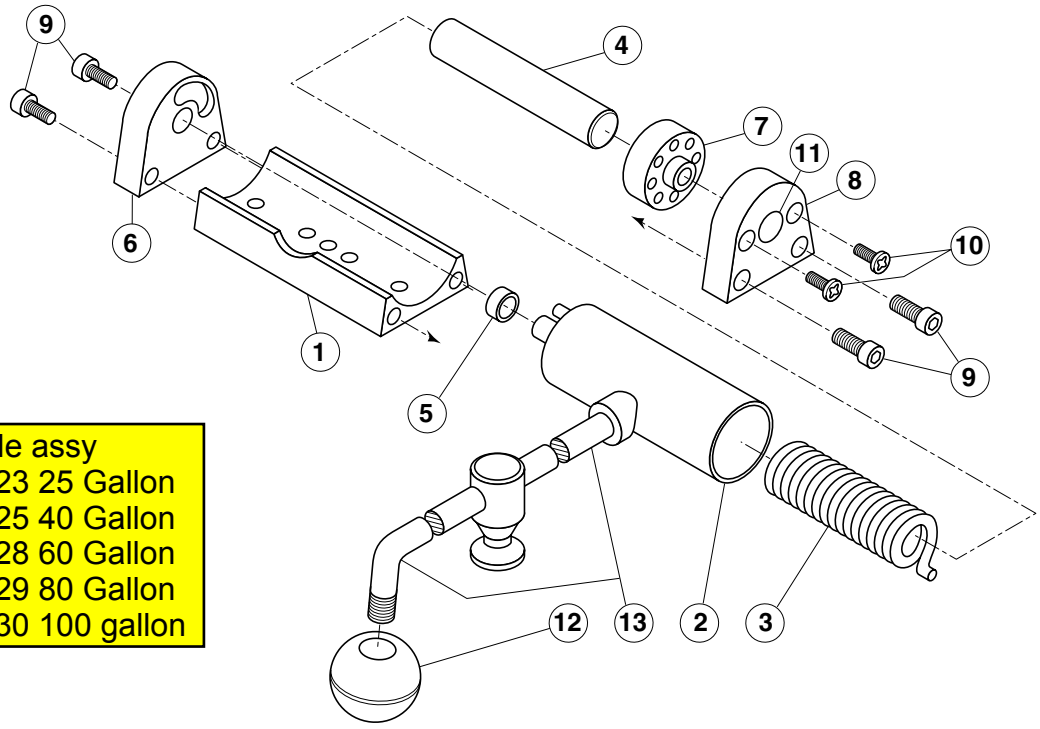
# PRESSURE RELIEF ASSEMBLY






| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| | | *PRESSURE RELIEF VALVE ASSEMBLIES* | |
| 1. | KE01450 | FOR ASME KETTLES (INCLUDES #2-6) | 1 |
| | KE01450-1 | FOR CE KETTLES (INCLUDES #2-6) | 1 |
| 2. | FI05049 | MALE CONNECTOR, 1/2" PIPE - 1/4" TUBE | 1 |
| 3. | FI00151 | STREET ELBOW, 90°, 1/2", BRASS | 2 |
| 4. | FI00178 | TEE, 1/2" FPT, BRASS | 1 |
| | | *SAFETY VALVES* | |
| 5. | KE54941-5 | SAFETY VALVE, 50 PSI, 1/2" (NORTH AMERICA) | 1 |
| | KE54941-31 | SAFETY VALVE, 50 PSI, 1/2", (EUROPE) | 1 |
| 6. | KE54223 | BLOW DOWN TUBE | 1 |
| 7. | KE54864 | ACCESS PANEL | 1 |
| 8. | FA11518-4 | THUMB SCREW, 10-32 X 1/2" L | 1 |

# HINGE ASSEMBLY

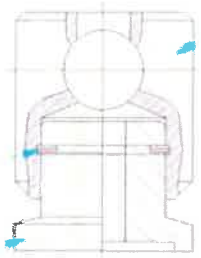



Handle assy
T40123 25 Gallon
T40125 40 Gallon
T40128 60 Gallon
T40129 80 Gallon
T40130 100 gallon

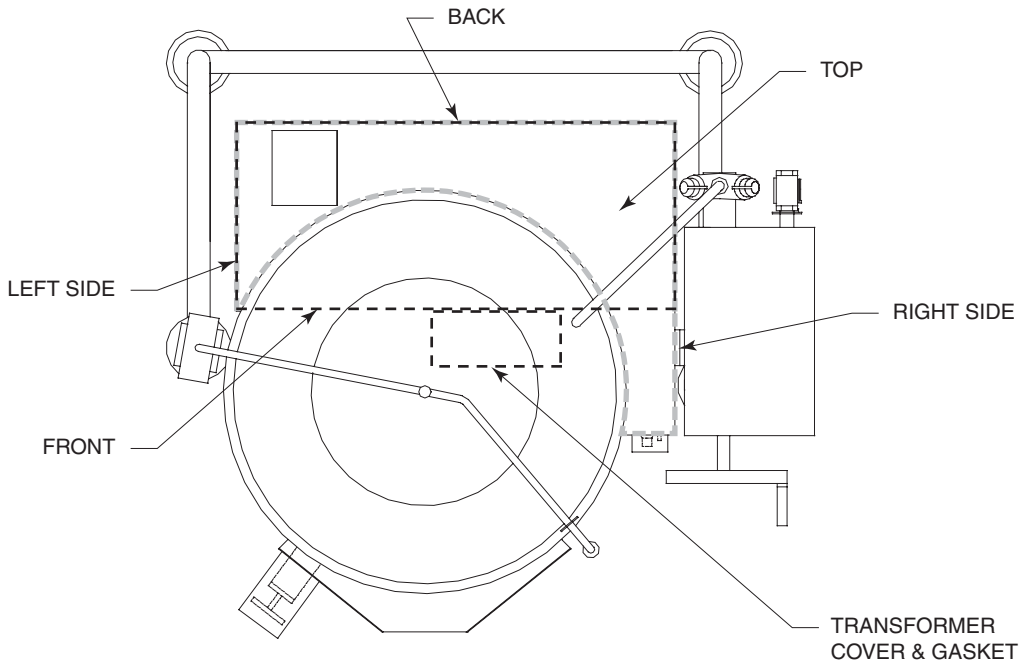
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| | | **Hinge Assembly** | |
| 1. - 11 | KE00597-1 | 25 - 40 Gallon, 20 Gallon Full Jacketed | 1 |
| | KE00597-2 | 60 - 80 Gallon, 30 - 40 Gallon Full Jacketed | 1 |
| | KE00597-3 | 100 - 150 Gallon, 60 - 100 Gallon Full Jacketed | 1 |
| | KE00597-4 | KDM-60, KDM-60-T, Cook Tank | 1 |
| | KE00597-5 | KDL-200, KDL-250, KDL-150-F, KDL-250-F | 1 |
| 1. | KE50822 | Hinge Base | 1 |
| 2. | KE51217 | Hinge Cylinder | 1 |
| 3. | KE50121-2 | **Hinge Spring Light** - for KE50597-2 | 1 |
| | KE50121-1 | **Hinge Spring Heavy** - for KE50597-1, KE50597-3, KE50597-4, KE50597-5, | 1 |
| 4. | KE50823-1 | Hinge Pin | 1 |
| 5. | KE50824 | Hinge Bearing | 1 |
| 6. | KE50819-1 | Hinge End Piece | 1 |
| 7. | KE50820 | Hinge Insert | 1 |
| 8. | KE50819 | Hinge End Piece | 1 |
| 9. | FA11284 | Screw, Socket Head | 4 |
| 10. | FA11507 | Cutting Screw, | 2 |
| 11. | KE54907-1 | Plug Button | 1 |
| 12. | KE50151-2 | Knob | 1 |
| 13. | | Cover Handle (specify model) | 1 |

The part that you have circled is KE00095. It is made of below parts. I think you are talking about part #3 which is a retaining ring.

#1 – KE50149
#2 – KE50150
**#3 – FA95068**



# WRAP COVERS




| KETTLE | TOP | FRONT | LEFT SIDE | RIGHT SIDE | BACK | WRAP COVER GASKET | TRANSFORMER COVER | TRANSFORMER COVER GASKET |
|---|---|---|---|---|---|---|---|---|
| KGL-40 | KE01479 | KE53483-4 | KE54253 | KE01432 | KE02186-1 | KE54419-1 | KE53871 | RB01851 (1ft.) |
| KGL-60 | KE01479-1 | KE53483-5 | KE54253-1 | KE01432-1 | KE02186-2 | KE54419-2 | KE53871-1 | RB01851 (1ft.) |
| KGL-80 | KE01479-2 | KE53483-6 | KE54253-2 | KE01432-2 | KE02186-3 | KE54419-3 | KE53871-1 | RB01851 (1ft.) |
| KGL-100 | KE01479-3 | KE53483-7 | KE54253-3 | KE01432-3 | KE02186-4 | KE54419-4 | KE53871-1 | RB01851 (1ft.) |
| KGL-40-T | KE01479 | KE53483 | KE54253 | KE01432 | KE02186-1 | KE54419-1 | KE53871-1 | RB01851 (1ft.) |
| KGL-60-T | KE01479-1 | KE53483-1 | KE54253-1 | KE01432-1 | KE02186-2 | KE54419-2 | KE53871-1 | RB01851 (1ft.) |
| KGL-80-T | KE01479-2 | KE53483-2 | KE54253-2 | KE01432-2 | KE02186-3 | KE54419-3 | KE53871-1 | RB01851 (1ft.) |
| KGL-40-SH | KE01479-4 | KE53483-6 | KE54253-2 | KE01432-2 | KE02186-3 | KE54419-3 | KE53871-1 | RB01851 (1ft.) |
| KGL-60-SH | KE01479-5 | KE53483-7 | KE54253-3 | KE01432-3 | KE02186-4 | KE54419-4 | KE53871-1 | RB01851 (1ft.) |
| KGL-40-TSH | KE01479-4 | KE53483-2 | KE54253-2 | KE01432-2 | KE02186-3 | KE54419-3 | KE53871-1 | RB01851 (1ft.) |

# MAINTENANCE

## INSPECTION AND MAINTENANCE CHECKLIST

Cleveland Range equipment requires little preventative maintenance. We do however provide the following chart as a guideline for inspection and maintenance to keep your unit functioning at 100%.

## INSPECTION AND MAINTENANCE CHECKLIST

The following checks should be completed every six months or more frequently if unit is in a high volume facility.

**WARNING**: It is imperative that damaged seals be repaired immediately to prevent equipment failure and/or damage.

| ITEM | CHECK |
|---|---|
| **KETTLE CONSOLE COVER** | Inspect gasket material for integrity. Replace if necessary.<br>Insure all screws are in place and firmly holding down the cover. If not replace/tighten screws. |
| **HAND WHEEL** (hand tilt models only) | Check hand wheel for tightness. If loose tighten allen screw. |
| **TILTING** (tilting models only) | Check that kettle tilts smoothly.<br>Grease as described in LUBRICATION PROCEDURE. |
| **ON/OFF SWITCH/ TEMPERATURE CONTROL** | Check for damage. Replace if necessary. |
| **PRESSURE GAUGE** | Check that the gauge does not have moisture on its inside face. Replace if moisture is present.<br>Check that the gauge shows a vacuum (needle is well into the Green zone) when cold and shows between 25-40 psi when unit is hot. If not follow VACUUM LEAK TEST PROCEDURE. |
| **PRESSURE RELIEF VALVE** | Check pressure relief valve as described in PRESSURE RELIEF VALVE TESTING PROCEDURE. |
| **TEMPERATURE CHECK** | Following CALIBRATING PROCEDURE check the inner kettle surface temperature with a digital surface thermometer and adjust if required. |
| **LUBRICATION** | Grease trunnion housings and gear/worm assembly as recommended in LUBRICATION INSTRUCTIONS. |
| **GEAR/WORM ASSEMBLY** | Inspect for play. Tighten Allen screws if required. |
| **SPRING ASSIST COVER** | Check cover is tightly secured to handle and insure spring is holding cover up - adjust if required. |

# Kettle Safety Inspection Checklist

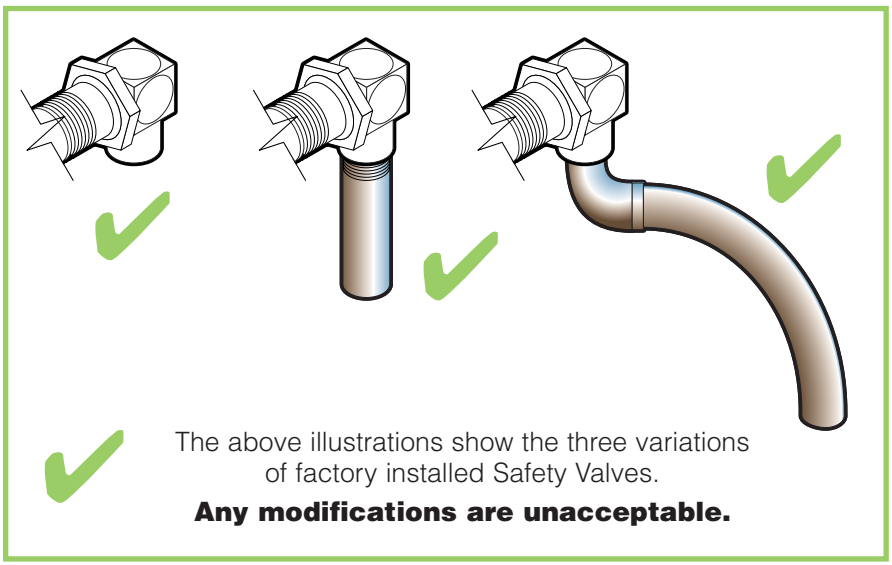
*Just recently a competitor's steam jacketed kettle exploded causing serious personal injury and damage to a kitchen. In most cases these accidents are caused by poor maintenance and/or incorrect installation.*

*We at Cleveland would like to restate that regular inspection and maintenance of units is essential to obtain trouble free and safe operation of equipment. Inspections must include testing of the pressure relief valve and checks of the operating system to insure that it has not been altered.*

***No safety features designed into the equipment should ever be tampered with**. Tampering with or bypassing controls is a very dangerous practice and unfortunately we have seen several cases of this. Following is a short list of the most common and the most dangerous alterations performed on kettles.*

---

## SAFETY VALVE:



The above illustrations show the three variations of factory installed Safety Valves.

**Any modifications are unacceptable.**

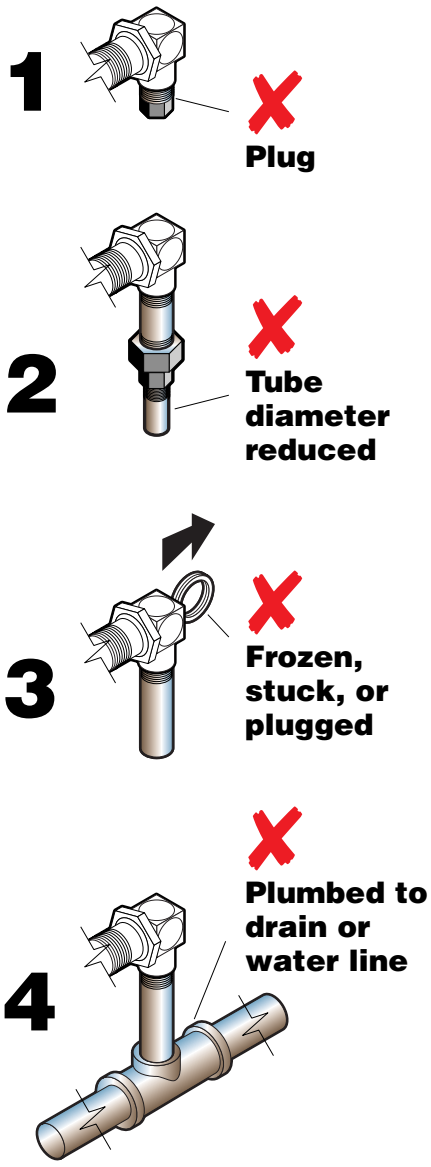
### *Incorrect Installations*

**1** Safety valve has plug threaded into the discharge opening preventing any steam from escaping.

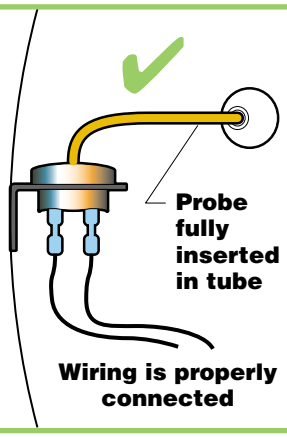
**2** Safety valve's tube diameter has been reduced.

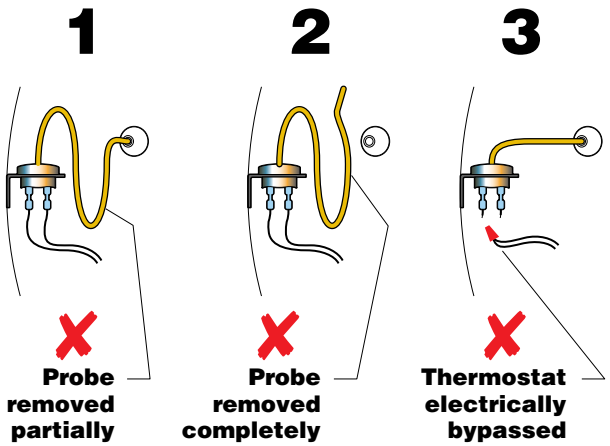
**3** Safety valve is sticking, frozen shut or plugged. To test, refer to Service Bulletin SE90038 rev. 2, "Pressure Relief Valve Periodic Testing".

**4** Safety valve is plumbed to a drain or water line creating back pressure and reducing flow.



# SAFETY THERMOSTAT:



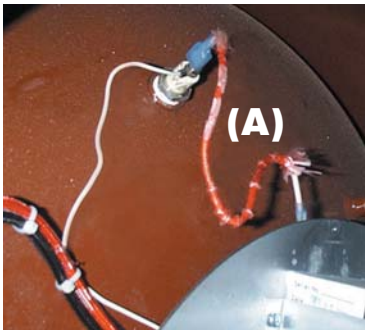




### Incorrect Installations

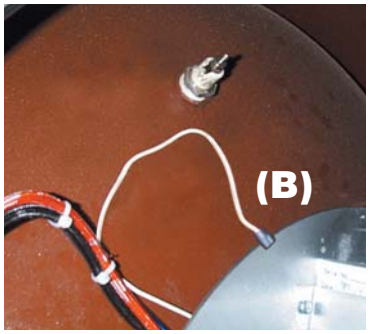
1. Safety thermostat probe is not completely inserted into tubing.
2. Safety thermostat probe is removed from tubing.
3. Safety thermostat electrical connection is bypassed.

# Low Water Level Probe:

Probe properly attached

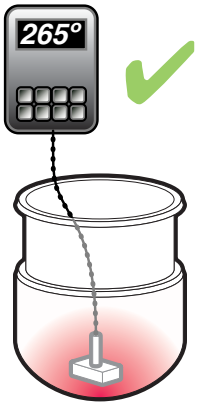



Probe bypassed by running (A) an additional wire




Probe bypassed by (B) grounding the connecting wire

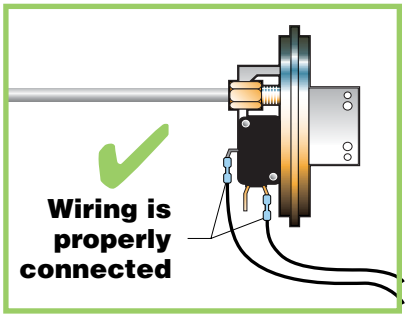
# Operating Thermostat:



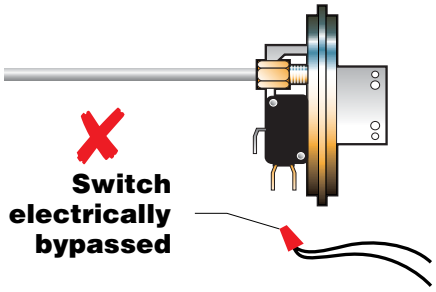

**260° - 270° MAXIMUM KETTLE TEMPERATURE**

If maximum temperature is not in this range (on empty kettle), refer to the "Calibrating Procedure" in the unit's Installation, Operation & Service Manual.

# Gas Kettle Air Switch



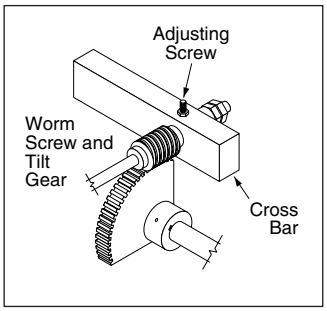

### Incorrect Installation




SE90047

## LUBRICATION PROCEDURE

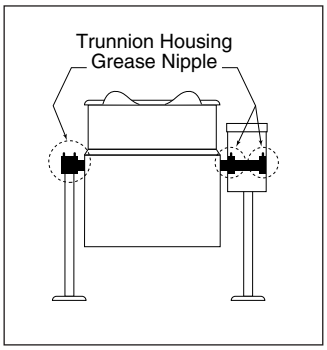
Lubricate the following parts every three months to insure smooth operation and reduce wear.




### *TRUNNION HOUSING, WORM SCREW AND TILT GEAR*

These parts are accessed through the top cover of the console.

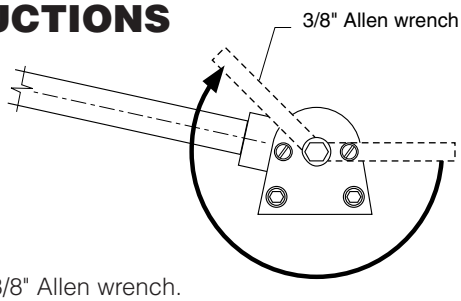
Apply grease to gear teeth. Check for excessive play and adjust with adjusting screw located on top of cross bar.




### *KETTLE TRUNNIONS*

On the left hand side of the kettle there are two grease nipples on the top back portion of the trunnion housing. On the right hand side of the kettle you must remove the console cover to access the two grease nipples.

## HINGE ADJUSTMENT INSTRUCTIONS




1. Insert 3/8" Allen wrench.
2. Turn clockwise to relieve tension on spring.
3. While tension is released remove one of the two slotted screws.
4. To prevent Allen wrench from springing back abruptly while the second slotted screw is removed, insert a pin (approximately 1/8") in the hole where the first slotted screw was removed from.
5. Remove second slotted screw.
6. While holding Allen wrench remove pin.
7. Turn Allen wrench clockwise to tighten or counter-clockwise to loosen tension to produce desired effect.
8. Re-insert pin in one of the two holes.
9. Tighten one slotted screw in the other hole (it may be necessary to turn Allen wrench slightly to align holes).
10. Remove pin and repeat step number 9 for other slotted screw.

# TROUBLESHOOTING GUIDES

### *GENERAL*

1. To turn the unit on, turn the switch to the on position.

   ■ Power is sent to primary side of the 120vac/16vac transformer.

   ■ Power is sent to the normally closed high limit.

   ■ From the high limit power is sent to the normally open contacts of the 12VDC relay and the L1 and L2 terminals of the ignition module.

2. From the secondary of the transformer 16VAC is sent to the controller.

   ■ Power is sent to the red LED (low water indicator light) from terminal 4 of the controller.

   ■ If the water probe is grounded through water the LED will go off.

   ■ If the water probe is not grounded the LED will remain on and the unit will not heat.

   ■ If the resistance of the thermistor is higher than the setting of the potentiometer( the unit is calling for heat) then 16VDC is sent to the coil of the relay and the green LED (heat indicator light)

   ■ The 12VDC relay will close until the unit reaches temperature

3. With the contacts of the relay closed, 120VAC is sent to the blower and primary coil of the 120VAC/24VAC transformer.

   ■ From the secondary of the 24VAC transformer power is sent to the normally open contacts of the air switch.

   ■ When the air from the blower closes the air switch, 24VAC is sent to the Th terminal of the ignition module.

4. With both 120VAC (at L1 and L2) and 24VAC (at Gnd and Th) to the ignition module then 120VAC will be sent to the surface igniter.

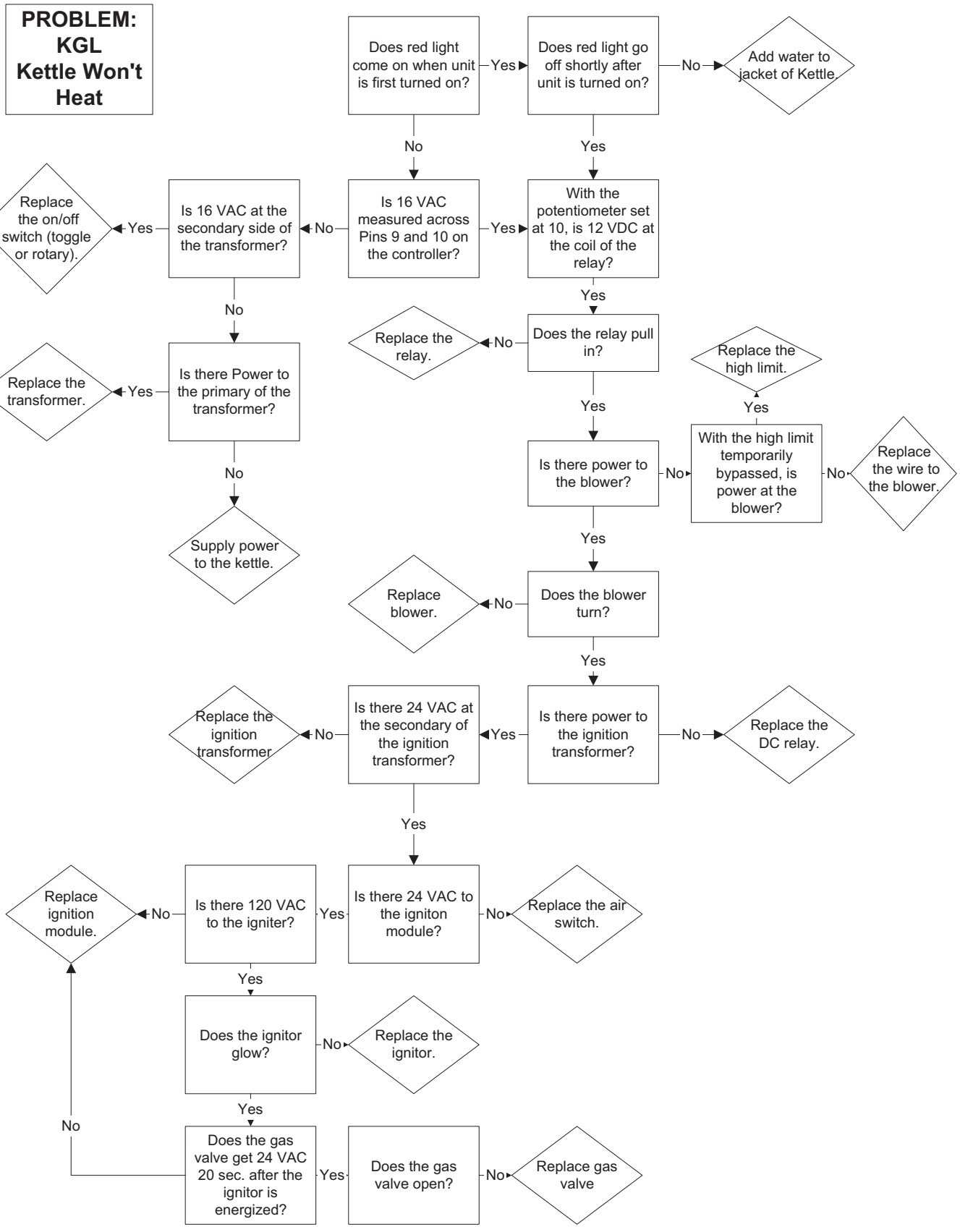
5. After the ignition module has been energized for 24 seconds the module will send 24VAC to the gas valve.

   ■ The gas will touch the hot igniter and ignite.

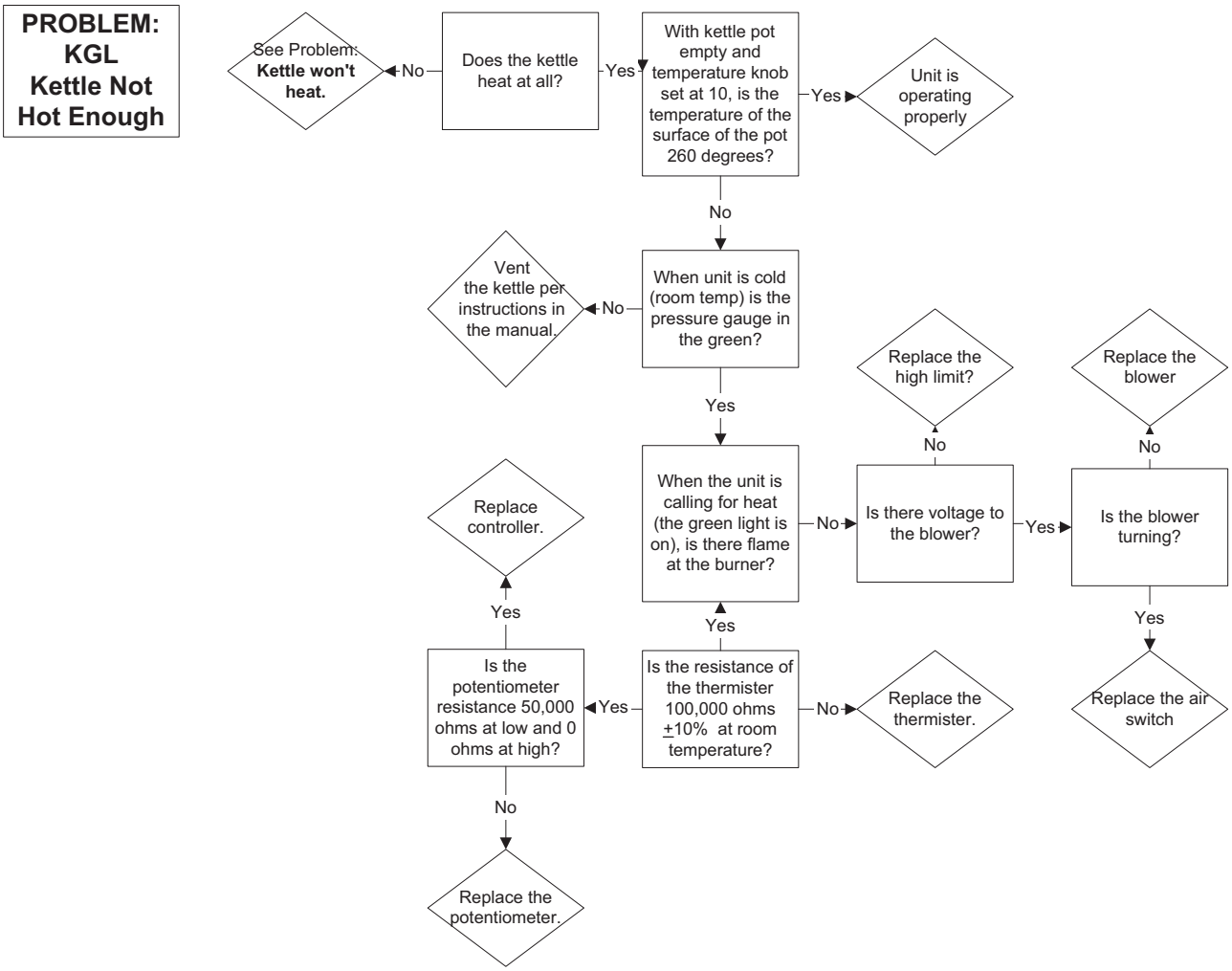
   ■ The kettle will build pressure until the controller is satisfied by the thermistor at the setting of the potentiometer.

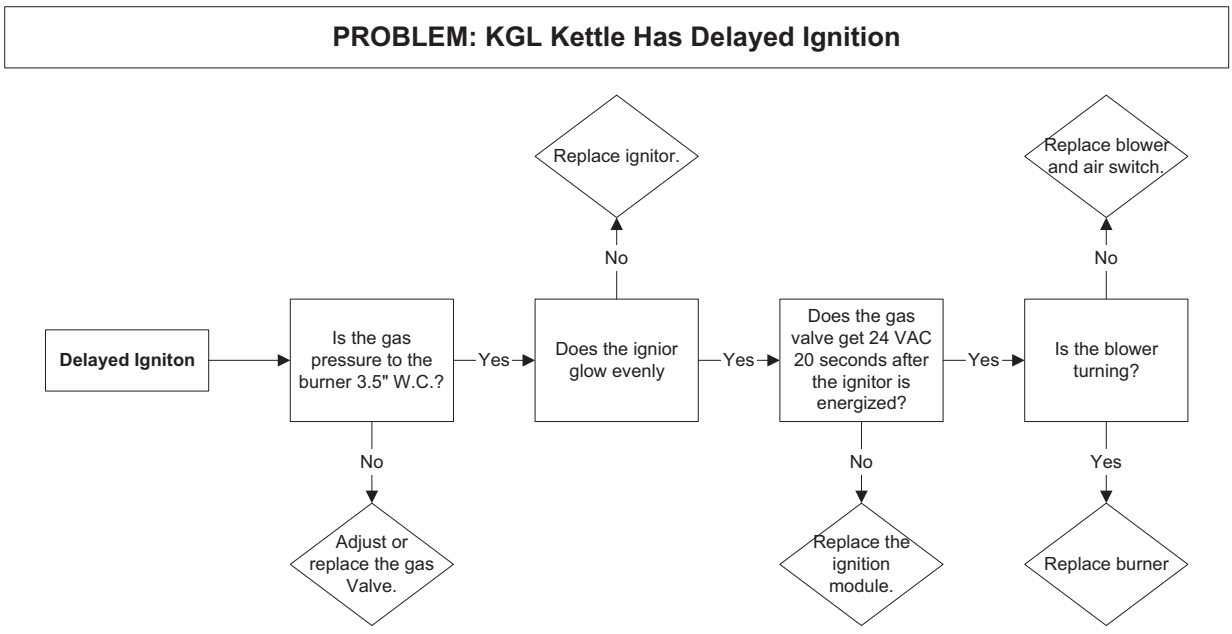
   ■ The controller will then turn off the heat circuit until the temperature of the kettle is below the setting

# TROUBLESHOOTING GUIDES (continued)



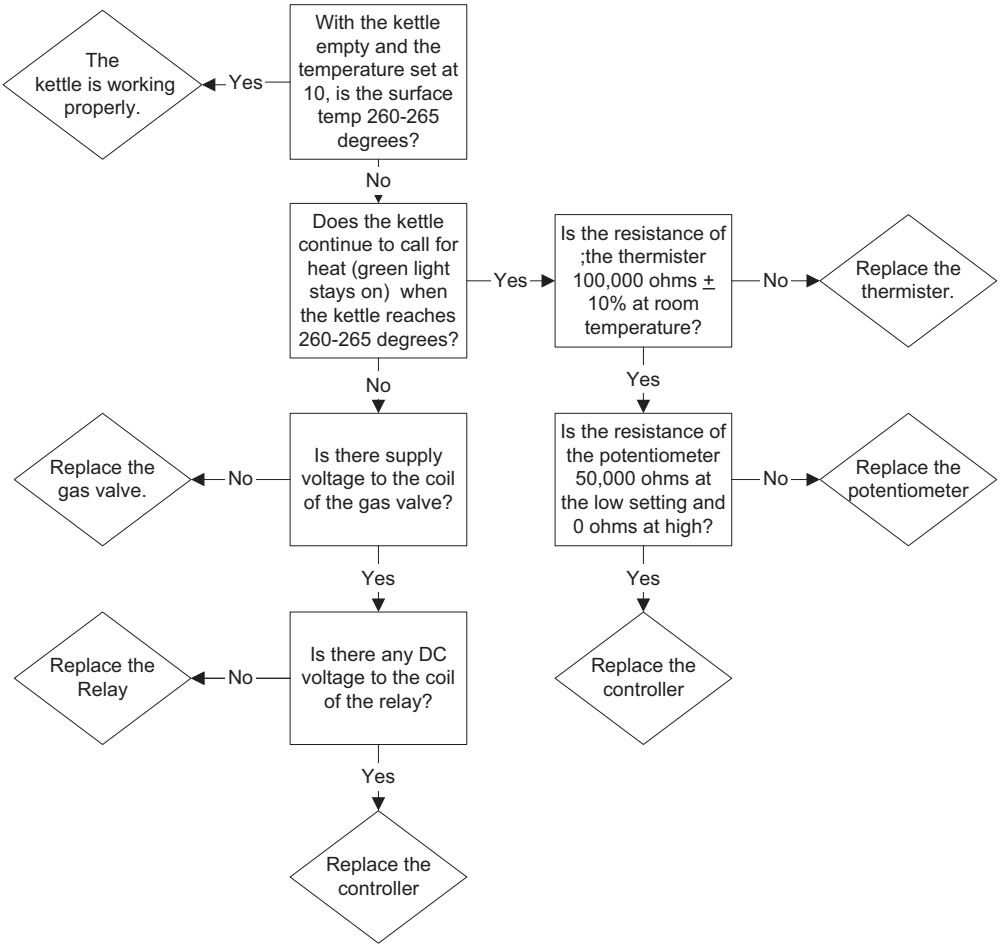
# TROUBLESHOOTING GUIDES (continued)



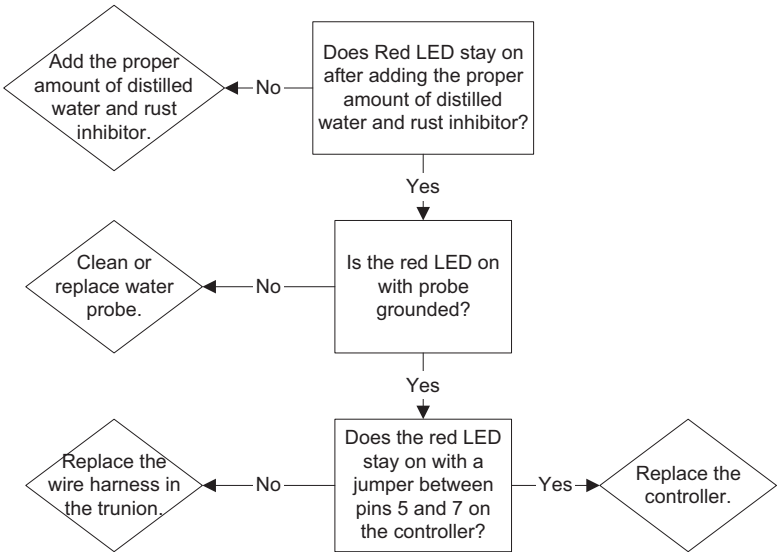



# TROUBLESHOOTING GUIDES (continued)

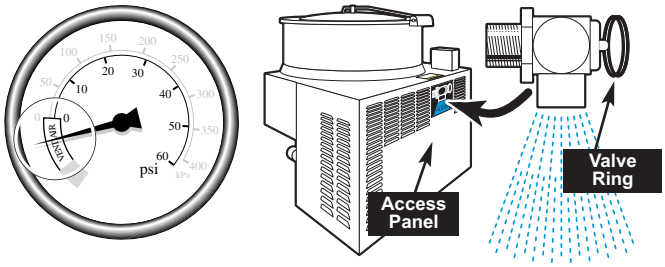
**PROBLEM: KGL Kettle Gets Too Hot**




**PROBLEM: Red Add Water LED Stays On**



# KETTLE VENTING INSTRUCTIONS

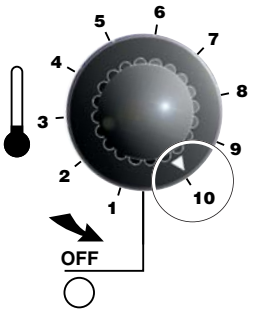



The following venting procedure should be followed when the Vacuum/Pressure Gauge needle is in the "VENT AIR" zone:

**NOTE**: Check for and eliminate leaks prior to venting (See REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS).

**DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.**

**DANGER: WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.**

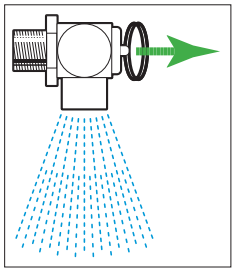



**1.** Remove Access Panel from back of main kettle console.

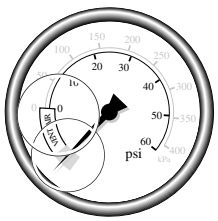
**2.** Turn kettle ON and set temperature control to **10**, heat the empty kettle until unit cycles off.

**3.** Vent kettle by pulling Valve Ring eight to fifteen times, holding valve open for two seconds each time.

**NOTE**: If unit cycles ON, stop venting and wait for kettle to cycle OFF before continuing.



**4.** Turn kettle OFF. Add cold water to kettle until its surface temperature is below 100°F. The pressure gauge needle should be in the green zone, indicating a vacuum in the kettle's jacket.




**5.** If needle is in the green zone then venting was successful. If not repeat procedure.

# VACUUM LEAK TEST PROCEDURE

If the kettle will not hold vacuum, test for leaks at:

**A.** Water Level Probe.

**B.** Pressure Relief Valve/Pressure Gauge and connecting plumbing.

**C.** Boiler Drain Cap.

**D.** Sight Glass.

***LEAK TEST PROCEDURE:***

**1.** Heat kettle until unit cycles off.

**2.** Shut off power to the kettle at the fused disconnect switch.

**3.** Spread Bubble Type Leak Detector over suspected areas and watch closely for bubbles.

**4.** Repair areas as required.

# REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS

If unit will not hold a vacuum the most likely cause is a leak at one of the fittings.

Often, the easiest way to eliminate a leak is reseal the suspect areas.

**1.** Water Level Probe

Remove,clean threads, apply teflon thread sealant and reinstall.

**2.** Pressure Relief Valve

**A**/ Inspect for signs of leaks. Replace if required.

**B**/ Remove, clean threads, apply teflon thread sealant and reinstall.

**3.** Pressure Gauge

**A**/ Inspect face of gauge. If it contains moisture on the inside of face replace.

**B**/ Check tightness of plumbing connection to pressure Gauge.

**3.** Sight Glass

**A**/ Check tightness of sight glass.

**B**/ Replace "O" ring if required.

# RESERVOIR FILL PROCEDURES

**WARNING: IMPROPER REFILLING OF KETTLE JACKET WILL RESULT IN IRREVERSIBLE DAMAGE TO UNIT.**

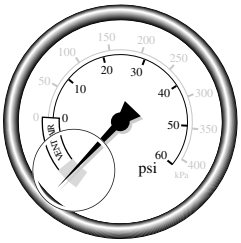
The kettle's water level must be maintained at the proper level. Under normal operating conditions, the sealed water reservoir should never require the addition of water.

If the red "low water" light comes on during use (while the kettle is in an upright position), the water level has reached a critically low level. The low water protection control has automatically shut off the gas burner. The following procedure must be completed before further use:

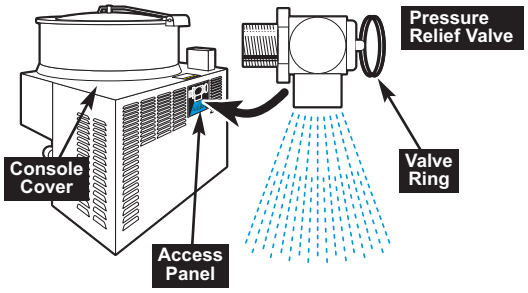
**DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.**

**DANGER: WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.**

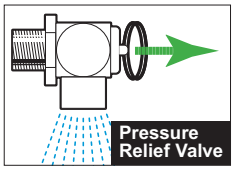
**NOTE:** Have a qualified service technician repair the leakage problem and add water to the unit. Ensure that the red "low water" light is on when the kettle is upright. On tilting kettles, it is normal for the red light to come on when the kettle is in a tilted position.




1. Ensure kettle is at room temperature and pressure gauge showing zero or less pressure.
2. Shut off power to the kettle at the fused disconnect switch.



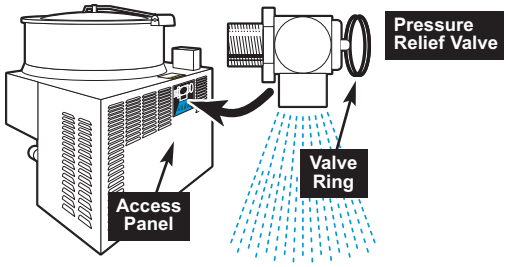

3. Remove Console Cover and Access Panel.




**Important**- Pull ring on Pressure Relief Valve prior to removal to insure vessel is not pressurized.


4. Pull Pressure Relief Valve Ring open to insure vessel is not pressurized.
5. Remove 1/4" copper tubing and reducer bushing.
6. Add distilled water using a funnel if necessary. Fill the unit to the high level mark on the Sight Glass.
7. Apply a thread sealant (i.e. Teflon tape) to the reducer bushing threads and replace.
8. Replace Console Cover and Access Panel.
9. Restore power to unit at the fused disconnect switch.
10. The kettle must now be vented. (Refer to the KETTLE VENTING INSTRUCTIONS).

# PRESSURE RELIEF VALVE PERIODIC TESTING



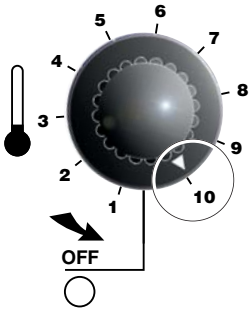

Most insurance agencies require periodic testing of pressure relief valves used on pressure vessels. This procedure will allow you to safely and quickly test your kettle's pressure relief valve. We recommend this test be performed twice a year.

**DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.**

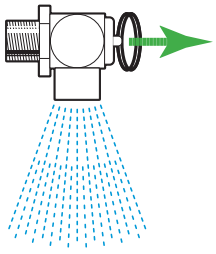
**DANGER: WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.**

**NOTE:** The following instruction is intended for use by qualified service personnel.

**WARNING:** Kettle surface will be hot and steam will be released during testing. Take necessary precautions including the use of gloves and eye protection to prevent personal injury.




1. With the kettle empty, set On-Off Switch/Temperature Control to "**10**" (Max.). Allow the kettle to heat until the unit cycles off.
2. Switch On-Off Switch/Temperature Control to "**0**" (Off) and disconnect main power at fused disconnect switch.
3. Remove Access Panel at back of main kettle console.



4. Pull Pressure Relief Valve Ring open for a maximum of one second. Repeat test three to four times. Each time the mechanism should move freely and be accompanied by a rapid escape of steam.

**NOTES:**

If valve appears to be sticking replace pressure relief valve.

If foreign material is discharged then drain kettle and replace pressure relief valve.

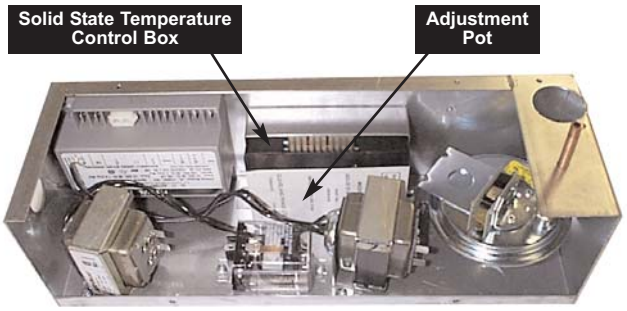
See KETTLE JACKET CLEANOUT AND PASSIVATION PROCEDURES for full instructions on the correct method for draining and refilling kettle jacket.

**WARNING:** Improper refilling of kettle jacket will result in irreversible damage to unit.

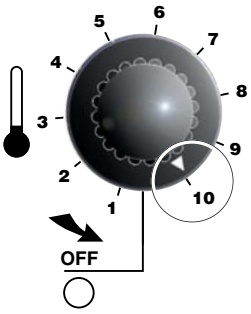
**5.** Replace Access Panel.

**6.** Reconnect main power at fused disconnect switch..

# CALIBRATING PROCEDURE




1. Insure the unit has a vacuum before you begin calibrating procedures. If unit requires venting refer to KETTLE VENTING INSTRUCTIONS.




2. Set On-Off Switch/Temperature Control to "**10**" (Max.).
3. Allow the unit to cycle twice.
4. Check temperature of the inner kettle surface with a digital surface thermometer.
5. Temperature should be between 260°F and 265°F.
6. Using a screw driver adjust temperature by turning the potentiometer on the Solid State Temperature Control Box. Turn very little. Turn clockwise to INCREASES and counter-clockwise to DECREASE temperature.
7. Allow the unit to cycle twice.
8. Check temperature of the inner kettle surface with a digital surface thermometer.
9. Repeat steps **4.** through **8.** until unit is calibrated.

# KETTLE JACKET CLEANOUT AND PASSIVATION PROCEDURES

The following procedure should be preformed at least once every three years to prevent possible corrosion and ensure the optimum life of the kettle.

**WARNING:**
**IMPROPER REFILLING OF KETTLE JACKET WILL RESULT IN IRREVERSIBLE DAMAGE TO UNIT.**

**DANGER:**
**MOLYFILM 315 IS CORROSIVE, AVOID CONTACT WITH SKIN AND EYES.**

**DANGER:**
**AVOID INHALATION - VAPORS FROM MOLYFILM 315 MAY BE HARMFUL OR FATAL.**

**DESCRIPTION** - Molyfilm 315 inhibits corrosion in stainless steel and copper. A pH buffer is present to assist in maintaining the appropriate pH to assist in corrosion inhibition.

**DISPOSAL** - Follow all Federal, State and local codes when disposing of product.

**SHELF LIFE** - Molyfilm 315's effectiveness will diminish after three years.

**REFILL QUANTITIES** (ORDERING INFO: 1 Liter Molyfilm 315 Rust Inhibitor -

IMPORTANT: To ensure satisfactory mixing follow the MIXING / FILLING PROCEDURE described below.

| Kettle Size | Volume of Water | | Volume of Molyfilm 315 | |
|---|---|---|---|---|
| | U.S. Gal. | Liters | oz. | cc (ml.) |
| 40 U.S. Gal. | 6.5 | 24.5 | 7.8 | 230 |
| 60 U.S. Gal. | 6.6 | 25.0 | 8.9 | 260 |
| 80 U.S. Gal. | 7.0 | 26.5 | 9.5 | 280 |
| 100 U.S. Gal. | 7.4 | 28.0 | 10.2 | 300 |

## MIXING / FILLING PROCEDURE

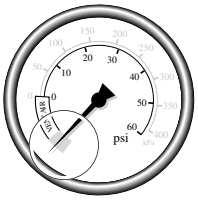
1. Refer to chart to determine the required volumes of water and Molyfilm 315.
2. In a separate container mix 1/2 gallon of the required volume of water with the total required volume of Molyfilm 315.
3. Pour mixture into kettle.
4. Pour the remaining required volume of water into kettle.

**DANGER:**
**PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.**

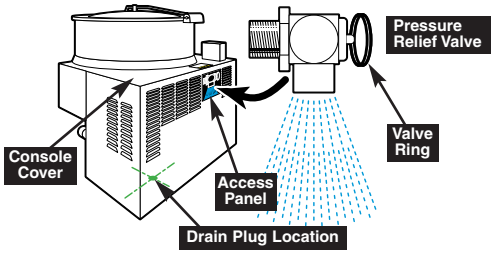
**DANGER:**
**WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.**

**DANGER:**
**EXTREMELY HOT SURFACES. WORK ONLY ON COLD KETTLE.**

## *Flushing Procedure*




1. Ensure kettle is at room temperature and pressure gauge showing zero or less pressure.
2. Shut off gas supply.
3. Remove electrical plug from power source.
4. Remove console cover and access panel.
5. Pull pressure relief valve ring open to insure vessel is not pressurized.
6. Remove 1/4" copper tubing and reducer bushing.
7. Remove drain plug cap and allow kettle to drain. Flush out as much debris as possible with water.
8. Apply a thread sealant (i.e. Teflon tape) to the drain plug cap and replace.
9. Fill kettle jacket with a mixture of water and Molyfilm 315 (see REFILL QUANTITIES chart).
10. Apply a thread sealant (i.e. teflon tape) to the reducer bushing threads and replace copper tubing and reducer bushing.
11. Turn kettle on, vent and heat on high for 1/2 hour.
12. Cool and drain kettle as per above procedure.



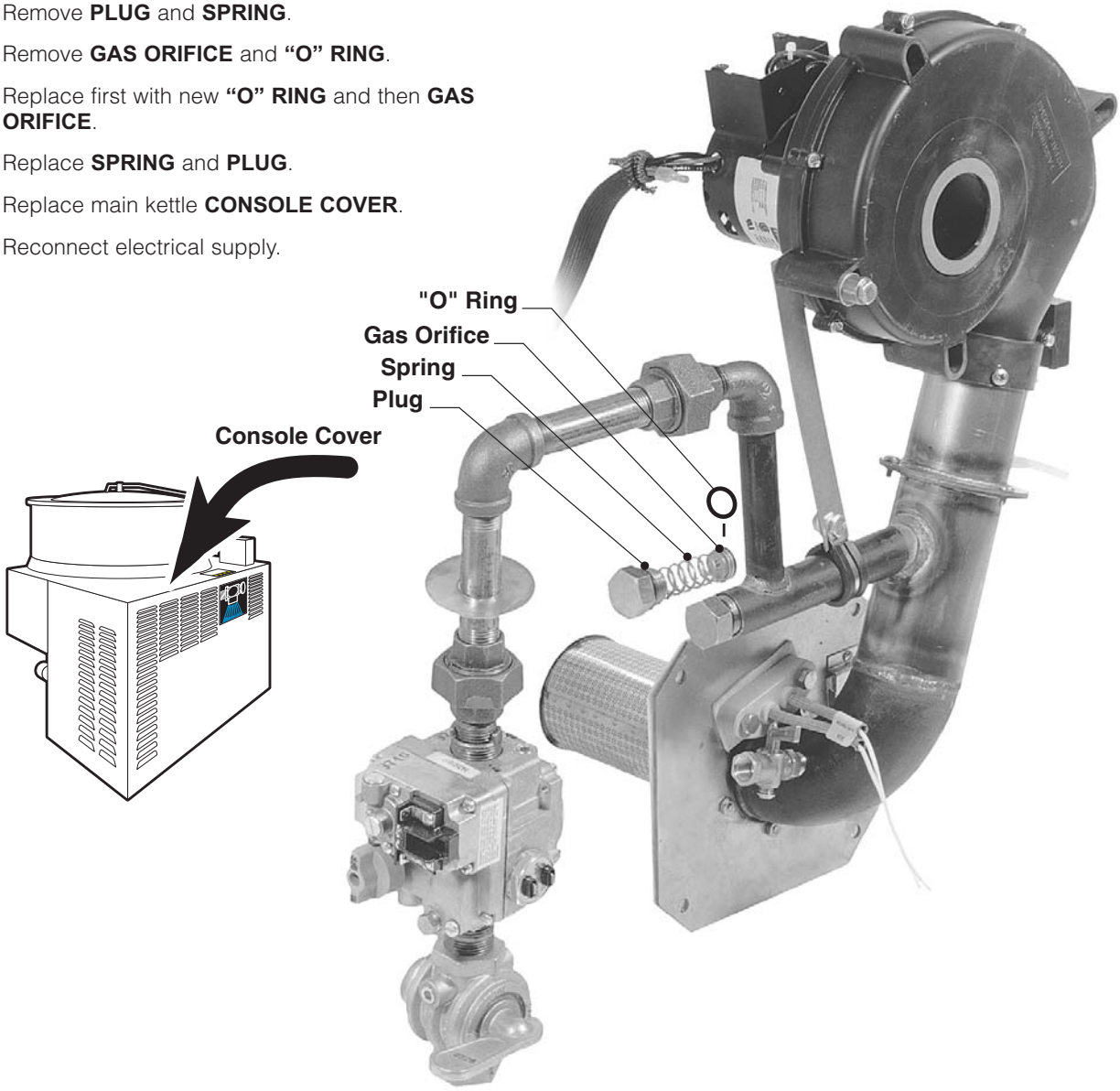

## *Refilling Unit*

1. Apply a thread sealant (i.e. Teflon tape) to the drain plug cap and replace.
2. Fill kettle jacket with a mixture of water and Molyfilm 315 (see REFILL QUANTITIES).
3. Apply a thread sealant (i.e. teflon tape) to the reducer bushing threads and replace.
4. Replace console cover and access panel.
5. Restore power to unit at the fused disconnect switch.
6. Vent kettle. See Kettle Venting Instructions for proper procedure.

# GAS KETTLE
# ORIFICE REPLACEMENT

**NOTE:** Use thread sealant compatible with propane gas on all threaded piping connections.

1. Disconnect electrical connection.
2. Shut off main gas supply and disconnect kettle from supply line.
3. Remove main kettle **CONSOLE COVER**.
4. Remove **PLUG** and **SPRING**.
5. Remove **GAS ORIFICE** and **"O" RING**.
6. Replace first with new **"O" RING** and then **GAS ORIFICE**.
7. Replace **SPRING** and **PLUG**.
8. Replace main kettle **CONSOLE COVER**.
9. Reconnect electrical supply.



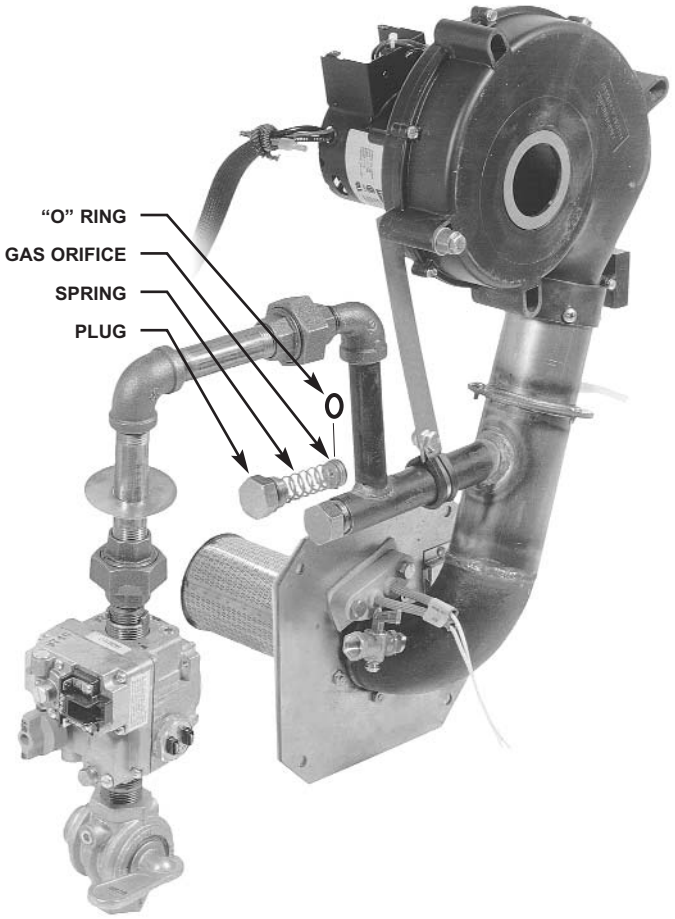

| Kettles | BTU's per Hour | Gas Type | Water Column | # of Orifices |
|---|---|---|---|---|
| KGL-40, | 140000 | Natural Gas | 3.5 | 1 |
| KGL-40-T, | 140000 | Propane | 3.5 | 1 |
| KGL-60 to 100, KGL-60-T to 80-T, KGL-40-TSH, KGL-40-F to 60-F, KGL-40-SH to 60-SH, | 190000 | Natural Gas | 3.5 | 1 |
| | 190000 | Propane | 3.5 | 1 |

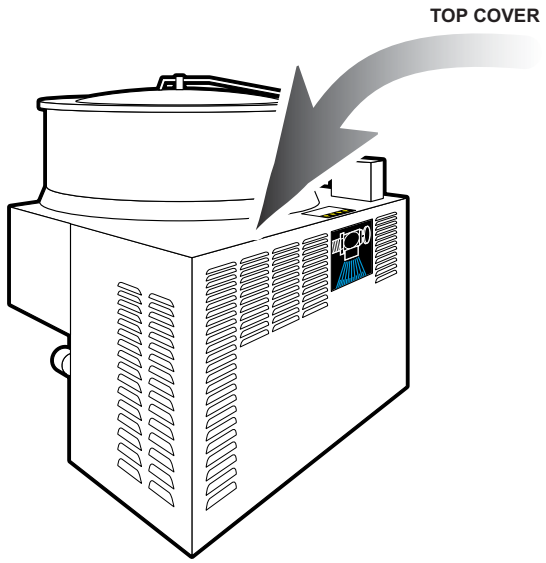
# *FIELD CONVERSION INSTRUCTIONS -*

*Natural Gas to Propane Gas*

## *Power Burner Gas Kettles*

| | BTU's per Hour | Gas Type | Water Column | # of Orifices |
|---|---|---|---|---|
| **KGL-40,** | 140000 | NAT | 3.5 | 1 |
| **KGL-40-T,** | 140000 | LP | 3.5 | 1 |
| **MKGL-40-T,** | | | | |
| **KGL-60 to 100,** | | | | |
| **KGL-60-T to 80-T,** | | | | |
| **KGL-40-TSH,** | 190000 | NAT | 3.5 | 1 |
| **KGL-40-F to 60-F,** | 190000 | LP | 3.5 | 1 |
| **KGL-40-SH to 60-SH,** | | | | |
| **HA-MKGL-60 to 100,** | | | | |
| **HA-MKGL-60 to 100-T** | | | | |




**NOTE:** Use thread sealant compatible with propane gas on all threaded piping connections.

1. Disconnect electrical connection.
2. Shut off main gas supply and disconnect kettle from supply line.
3. Remove **TOP COVER**.
4. Remove **PLUG** and **SPRING**.
5. Remove **GAS ORIFICE** and **"O" RING**.
6. Replace with new **GAS ORIFICE** and **"O" RING**.
7. Replace **SPRING** and **PLUG**.
8. Replace **TOP COVER**.
9. Place gas conversion label next to rating label.
10. Reconnect electrical supply.

## *Conversion Parts Required*

KGL-40

| Part No. | Description | Quantity |
|---|---|---|
| ~~KE95549~~ | ~~Conversion Label~~ | ~~1~~ |
| KE54420-1 | Air Intake Washer | 1 |
| KE53403-5 | Gas Orifice | 1 |
| FA05002-29 | "O" Ring | 1 |

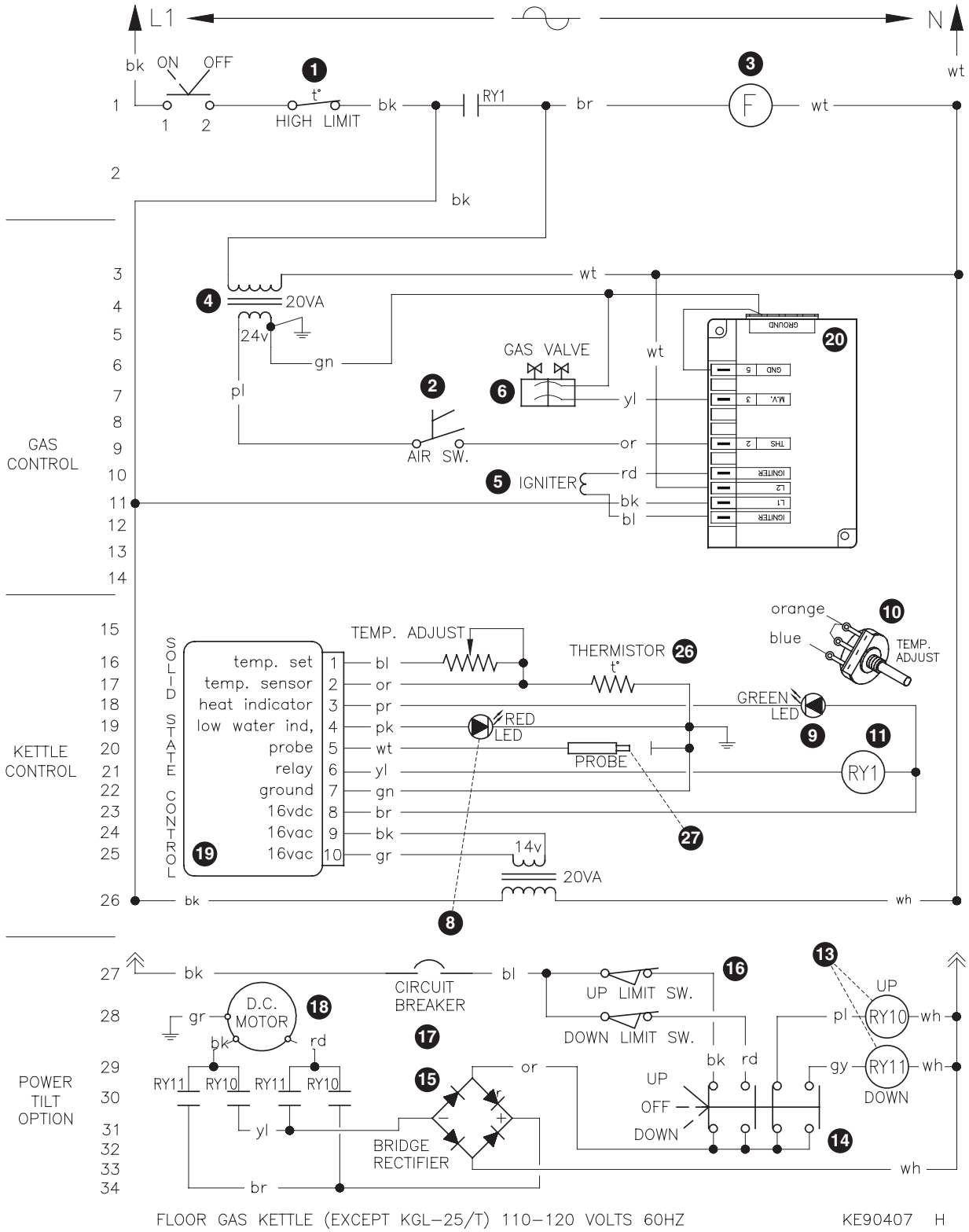
KGL-60 to 100

| Part No. | Description | Quantity |
|---|---|---|
| ~~KE95549~~ | ~~Conversion Label~~ | ~~1~~ |
| KE54420-1 | Air Intake Washer | 1 |
| KE53403-7 | Gas Orifice | 1 |
| FA05002-29 | "O" Ring | 1 |

# WIRING DIAGRAMS (after Sept. 2004)

## Diagram #1

Floor Gas Kettle (except KGL-25/T) 110-120 Volts, 60Hz (NORTH AMERICA)



# WIRING DIAGRAMS (after Sept. 2004)

## Diagram #1 (continued)

Floor Gas Kettle (except KGL-25/T) 110-120 Volts, 60Hz (NORTH AMERICA)

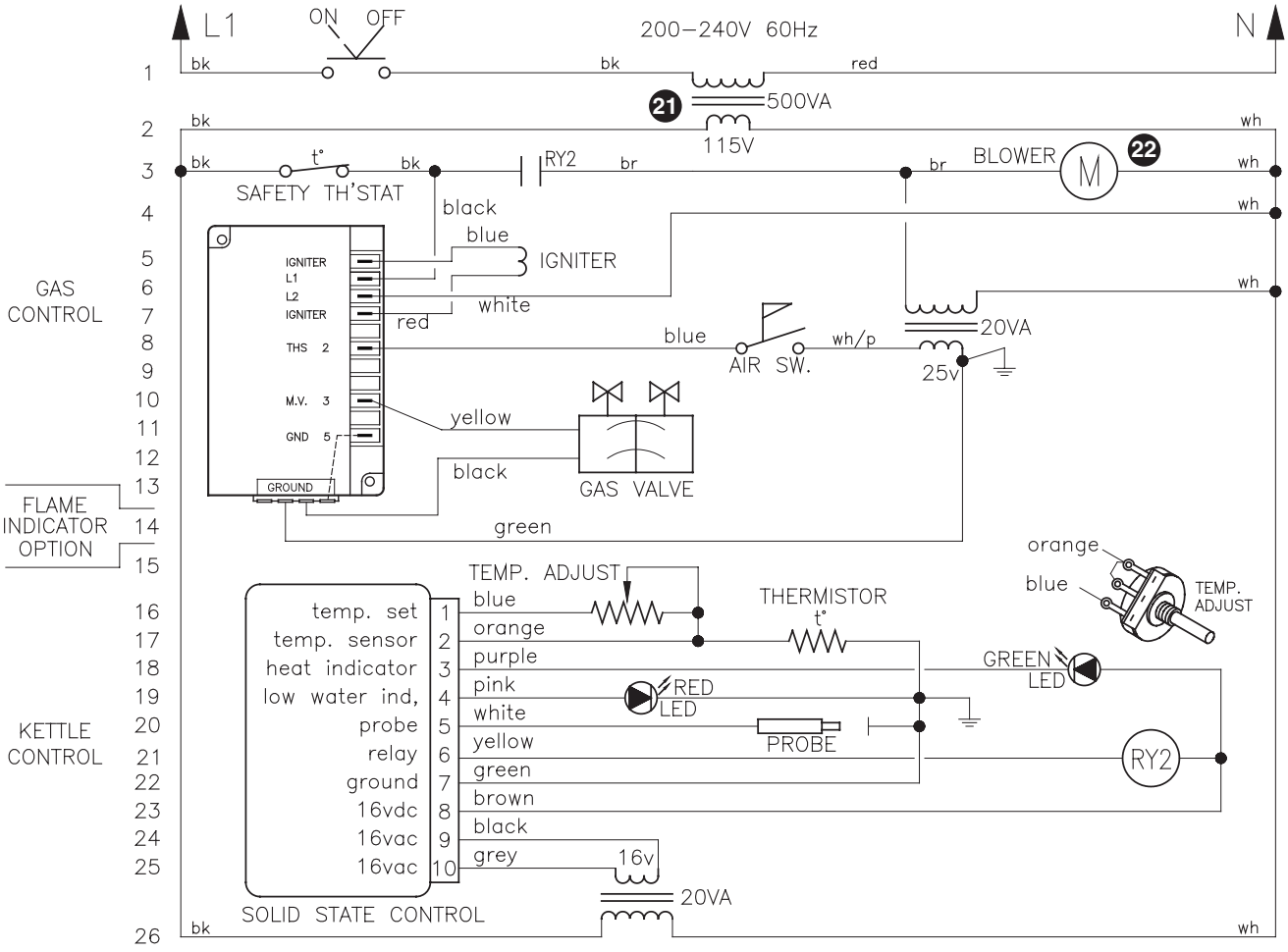
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | KE55069-6 | SAFETY THERMOSTAT | 1 |
| 2 | KE53436 | AIR PRESSURE SWITCH | 1 |
| 3 | KE53441 | BLOWER, 115V, 60 HZ | 1 |
| 4 | KE53838-20 | TRANSFORMER 120-24V | 1 |
| 5 | KE53437 | IGNITOR | 1 |
| 6 | KE53515 | GAS VALVE | 1 |
| 8. | SE003013-1 | L.E.D., RED, Replacement Kit., (includes LED & "O" Ring) | 1 |
| 9. | SE003013-2 | L.E.D., GREEN, Replacement Kit., (includes LED & "O" Ring) | 1 |
| 10 | SE00114 | POTENTIOMETER WITH ON/OFF SWITCH | 1 |
| 11 | KE50753-7 | RELAY, 120V | 1 |
| 12 | KE53838-20 | TRANSFORMER 120-24V | 1 |
| 13 | KE50753-10 | RELAY | 2 |
| 14 | FA20047 | JAM NUT 5/16-24 | 1 |
| | KE53137-3 | MOMENTARY SWITCH ACTIVATOR | 1 |
| | KE53184 | CONTACT SECTION HOLDER (LATCH) | 1 |
| 15 | KE50581 | BRIDGE RECTIFIER | 1 |
| 16 | KE51007 | MICRO SWITCH | 2 |
| 17 | KE50579 | CIRCUIT BREAKER | 1 |
| 18 | KE52832 | MOTOR "BODINE" #NSH-54RL | 1 |
| 19 | KE00458 | KETTLE SOLID STATE CONTROL BOX | 1 |
| 20 | KE53469-4 | IGNITION CONTROL MODULE | 1 |
| 26. | KE00515 | THERMISTOR | 1 |
| 27. | KE50556-2 | WATER LEVEL PROBE | 1 |

# WIRING DIAGRAMS (after Sept. 2004)

**Diagram #2** (see diagram #1 for common parts):

Floor Gas Kettle (except KGL-25/T) 200-240 Volts, 60Hz (NORTH AMERICA)

| *ITEM NO.* | *PART NO.* | *DESCRIPTION* | *QTY.* |
|---|---|---|---|
| 21 | KE53838-2 | TRANSFORMER 120-24V | 1 |
| 22 | KE53441 | BLOWER, 115V, 60 HZ | 1 |



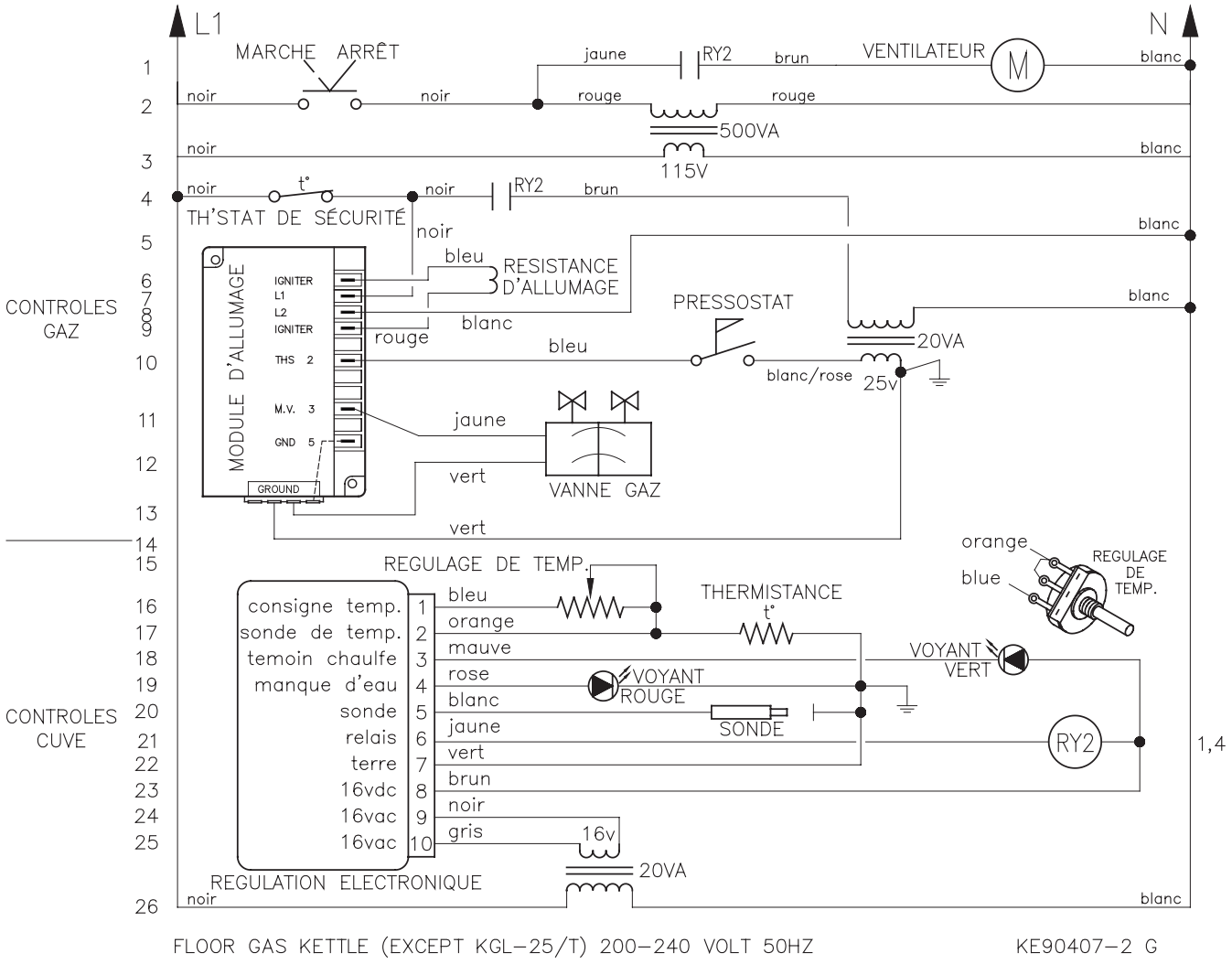

FLOOR GAS KETTLE (EXCEPT KGL–25/T) 200–240 60HZ

KE90407–1 G

# WIRING DIAGRAMS (after Sept. 2004)

## Diagram #3

Floor Gas Kettle (except KGL-25/T) 200-240 Volts, 50Hz (CE FRANCE)

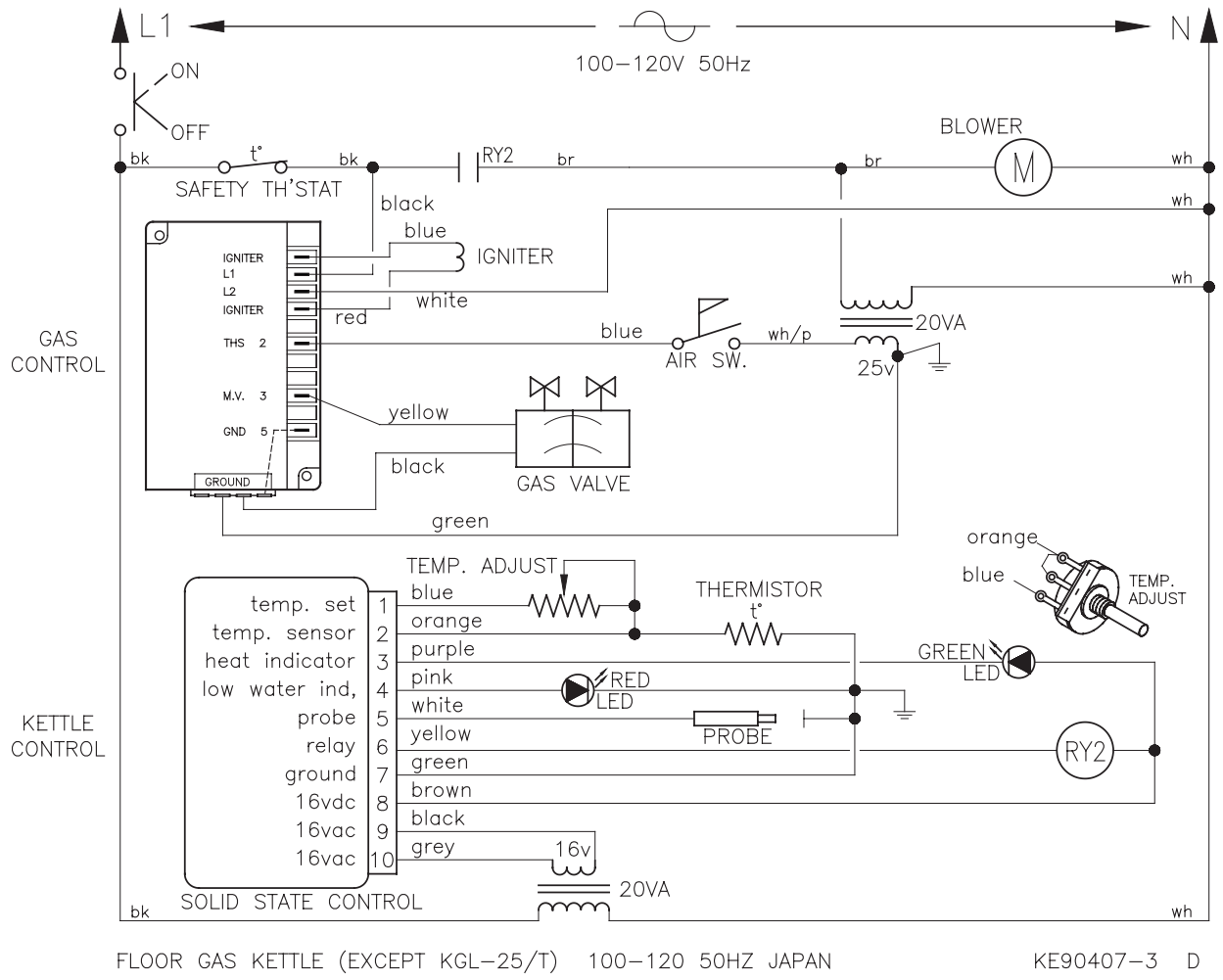



FLOOR GAS KETTLE (EXCEPT KGL-25/T) 200-240 VOLT 50HZ KE90407-2 G

# WIRING DIAGRAMS (after Sept. 2004)

## Diagram #4

Floor Gas Kettle (except KGL-25/T) 100-120 Volts, 50Hz (CE, JAPAN)

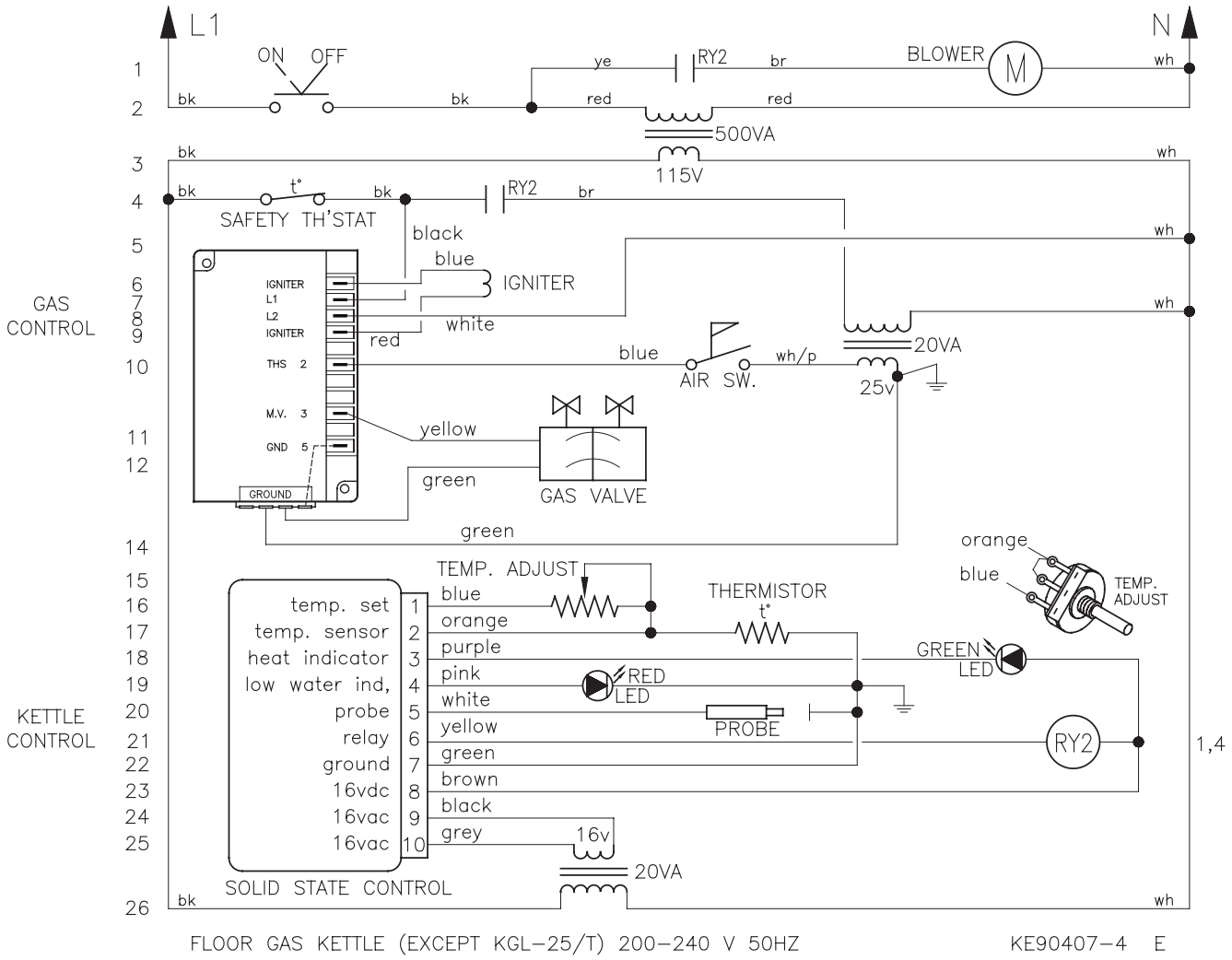



FLOOR GAS KETTLE (EXCEPT KGL–25/T) 100–120 50HZ JAPAN KE90407–3 D

# WIRING DIAGRAMS (after Sept. 2004)

## Diagram #5

Floor Gas Kettle (except KGL-25/T) 200-240 Volts, 60Hz (CE ENGLAND)

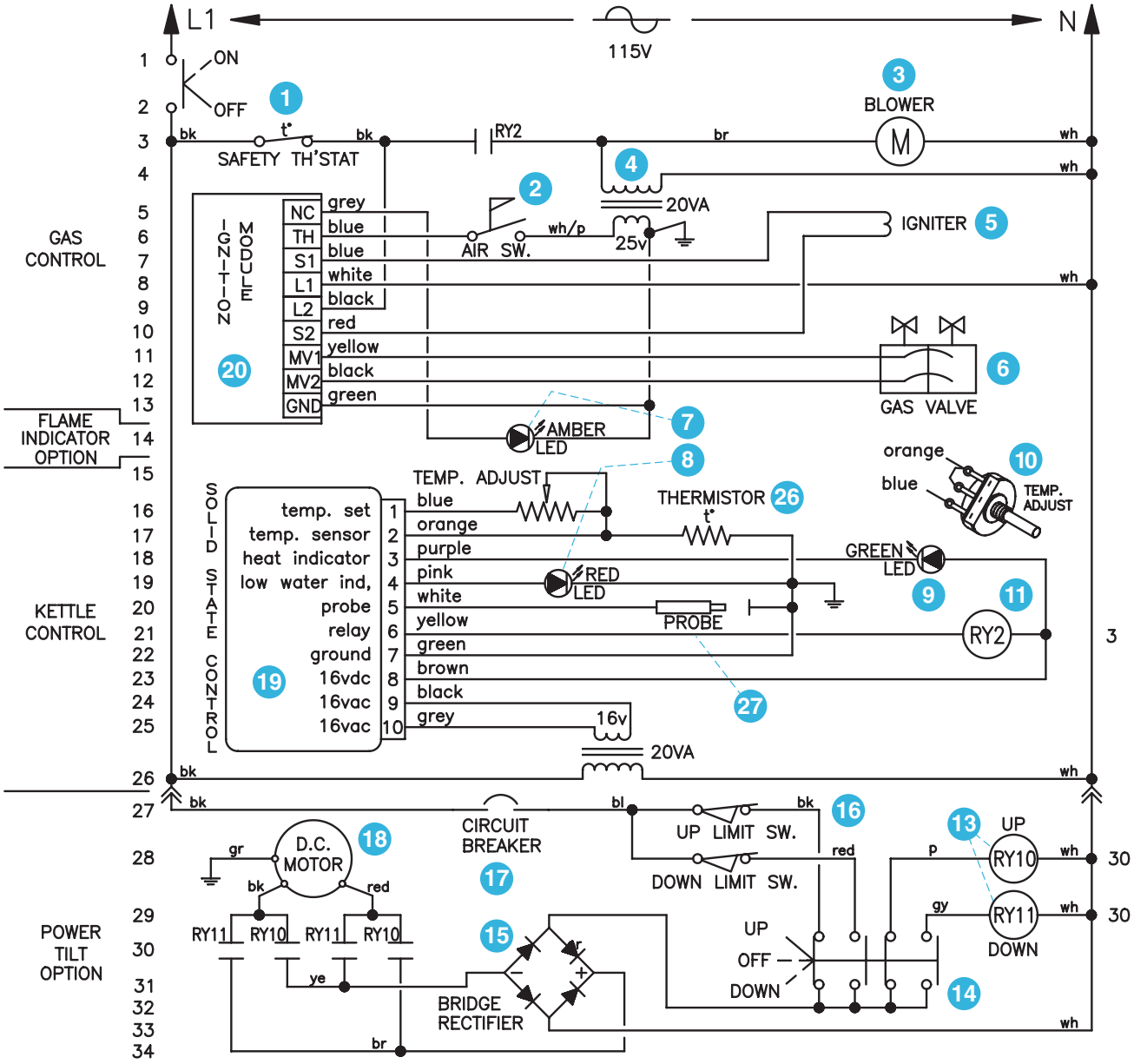



FLOOR GAS KETTLE (EXCEPT KGL-25/T) 200-240 V 50HZ KE90407-4 E

# WIRING DIAGRAMS (prior to Sept. 2004)

## Diagram #1

Floor Gas Kettle (except KGL-25/T) 110-120 Volts, 60Hz



# WIRING DIAGRAMS (prior to Sept. 2004)

## Diagram #1 (continued)

Floor Gas Kettle (except KGL-25/T) 110-120 Volts, 60Hz

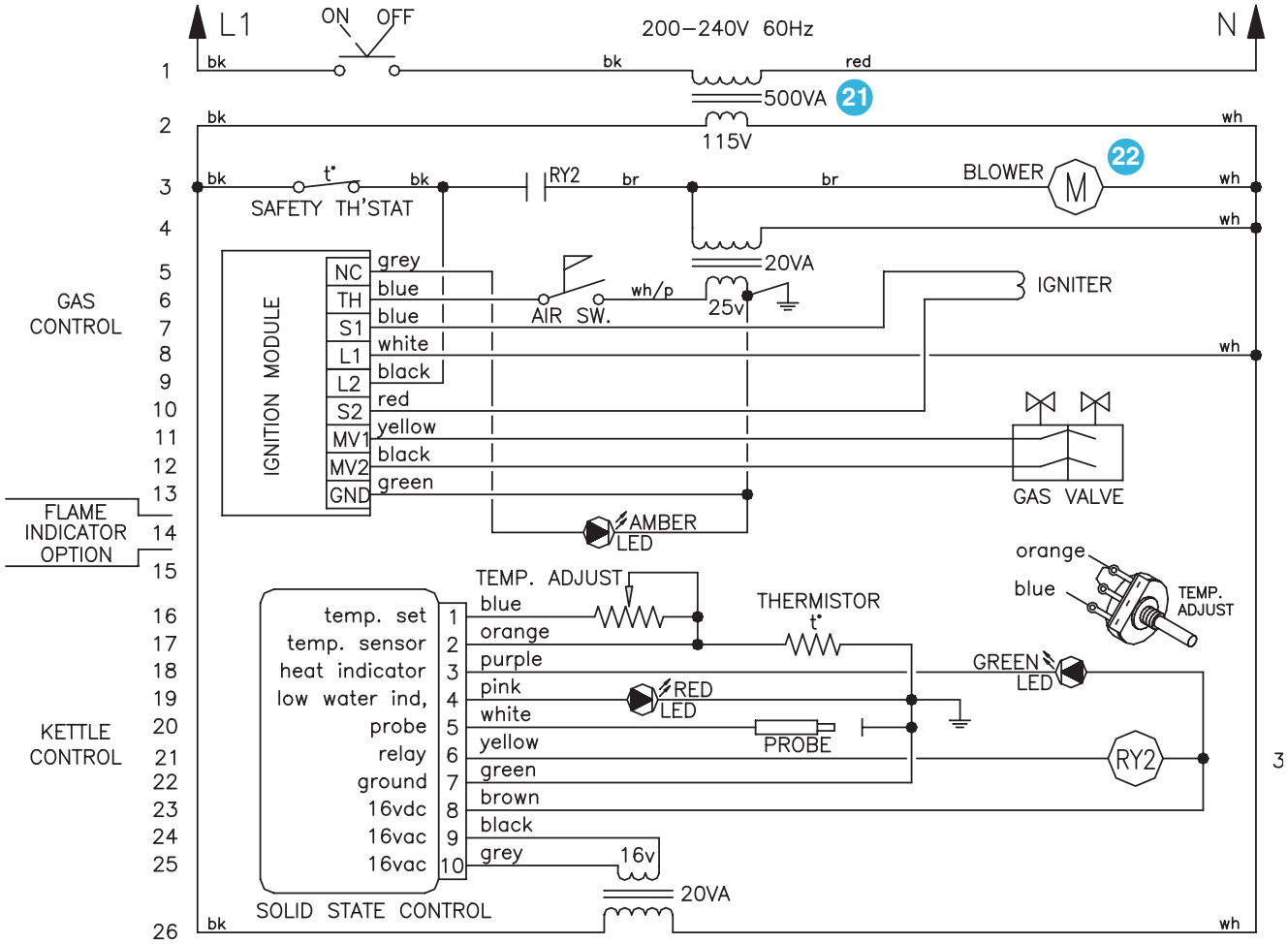
| ITEM NO. | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | KE55069-6 | SAFETY THERMOSTAT | 1 |
| 2 | KE53436 | AIR PRESSURE SWITCH | 1 |
| 3 | KE53441 | BLOWER, 115V, 60 HZ | 1 |
| 4 | KE53838-20 | TRANSFORMER 120-24V | 1 |
| 5 | KE53437 | IGNITOR | 1 |
| 6 | KE53515 | GAS VALVE | 1 |
| 7 | KE50567-2 | L.E.D., AMBER (USED PRIOR TO JULY 2004) | 1 |
| 8 | KE50567-1 | L.E.D., RED | 1 |
| 9 | KE50568-1 | L.E.D., GREEN | 1 |
| 10 | SE00114 | POTENTIOMETER WITH ON/OFF SWITCH | 1 |
| 11 | KE50753-7 | RELAY, 120V | 1 |
| 12 | KE53838-20 | TRANSFORMER 120-24V | 1 |
| 13 | KE50753-10 | RELAY | 2 |
| 14 | FA20047 | JAM NUT 5/16-24 | 1 |
| | KE53137-3 | MOMENTARY SWITCH ACTIVATOR | 1 |
| | KE53184 | CONTACT SECTION HOLDER (LATCH) | 1 |
| 15 | KE50581 | BRIDGE RECTIFIER | 1 |
| 16 | KE51007 | MICRO SWITCH | 2 |
| 17 | KE50579 | CIRCUIT BREAKER | 1 |
| 18 | KE52832 | MOTOR "BODINE" #NSH-54RL | 1 |
| 19 | KE00458 | KETTLE SOLID STATE CONTROL BOX | 1 |
| 20 | KE53469-4 | IGNITION CONTROL MODULE | 1 |
| 26. | KE00515 | THERMISTOR | 1 |
| 27. | KE50556-2 | WATER LEVEL PROBE | 1 |

# WIRING DIAGRAMS (prior to Sept. 2004)

**Diagram #2** (see diagram #1 for common parts)

Floor Gas Kettle (except KGL-25/T) 200-240 Volts, 60Hz

| *ITEM NO.* | *PART NO.* | *DESCRIPTION* | *QTY.* |
|---|---|---|---|
| 21 | KE53838-2 | TRANSFORMER 120-24V | 1 |
| 22 | KE53441 | BLOWER, 115V, 60 HZ | 1 |

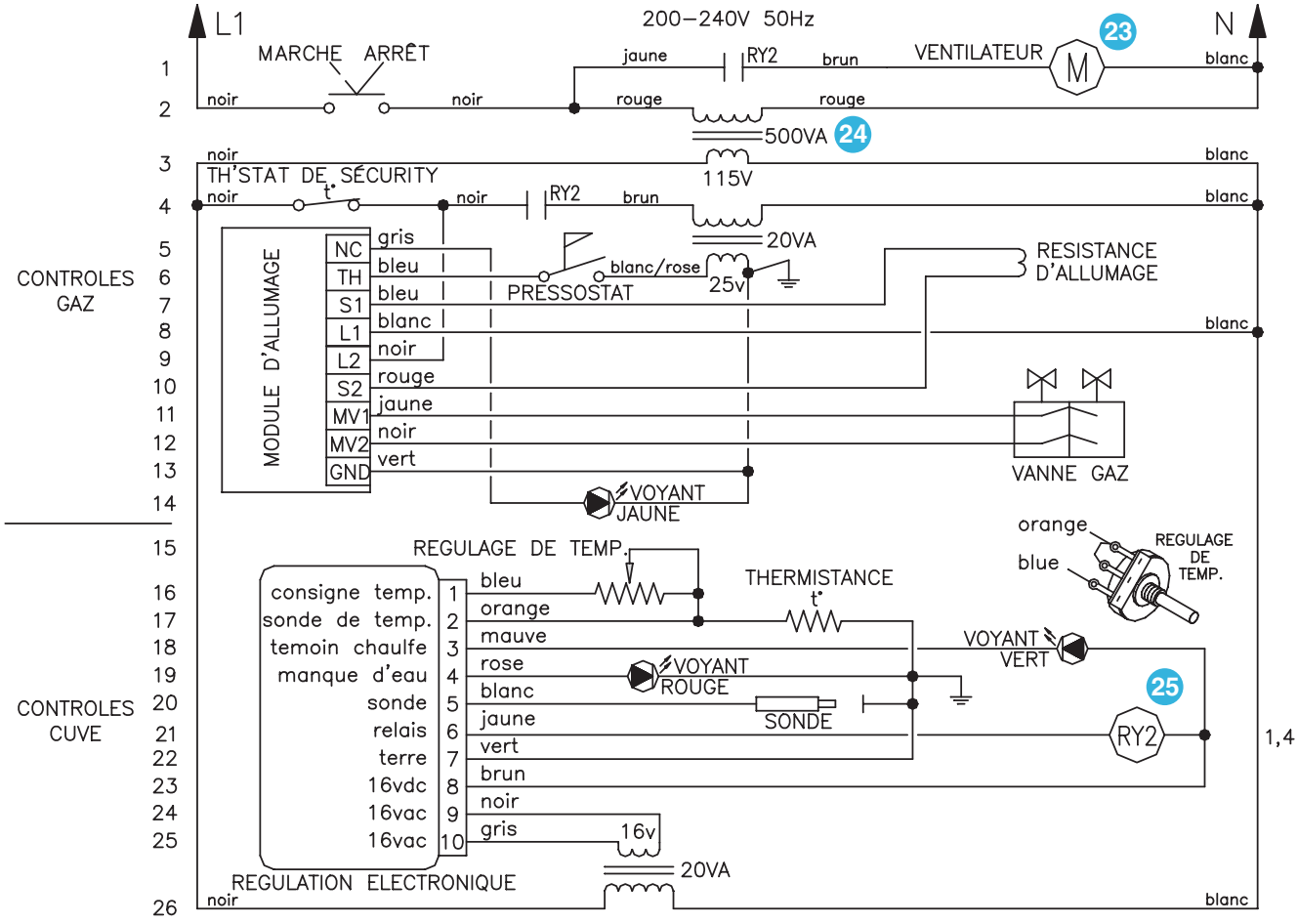


# WIRING DIAGRAMS (prior to Sept. 2004)

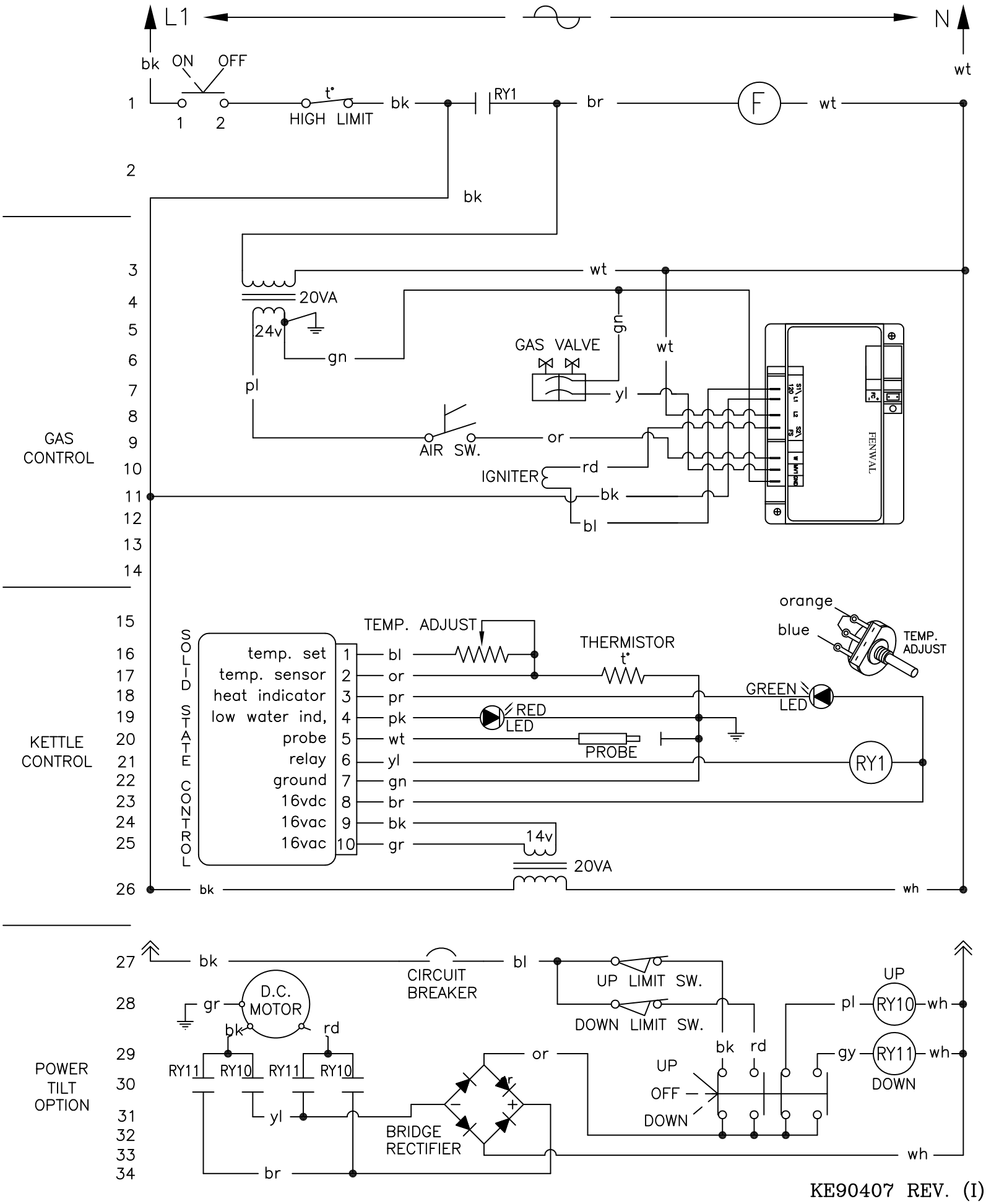
**Diagram #3** (see diagram #1 for common parts)

Floor Gas Kettle (except KGL-25/T) 200-240 Volts, 50Hz

| *ITEM NO.* | *PART NO.* | *DESCRIPTION* | *QTY.* |
|---|---|---|---|
| 23 | KE53441-1 | BLOWER, 220V, 50 HZ | 1 |
| 24 | KE53838-2 | TRANSFORMER 120-24V | 1 |
| 25 | KE50753-8 | RELAY, 240V | 1 |

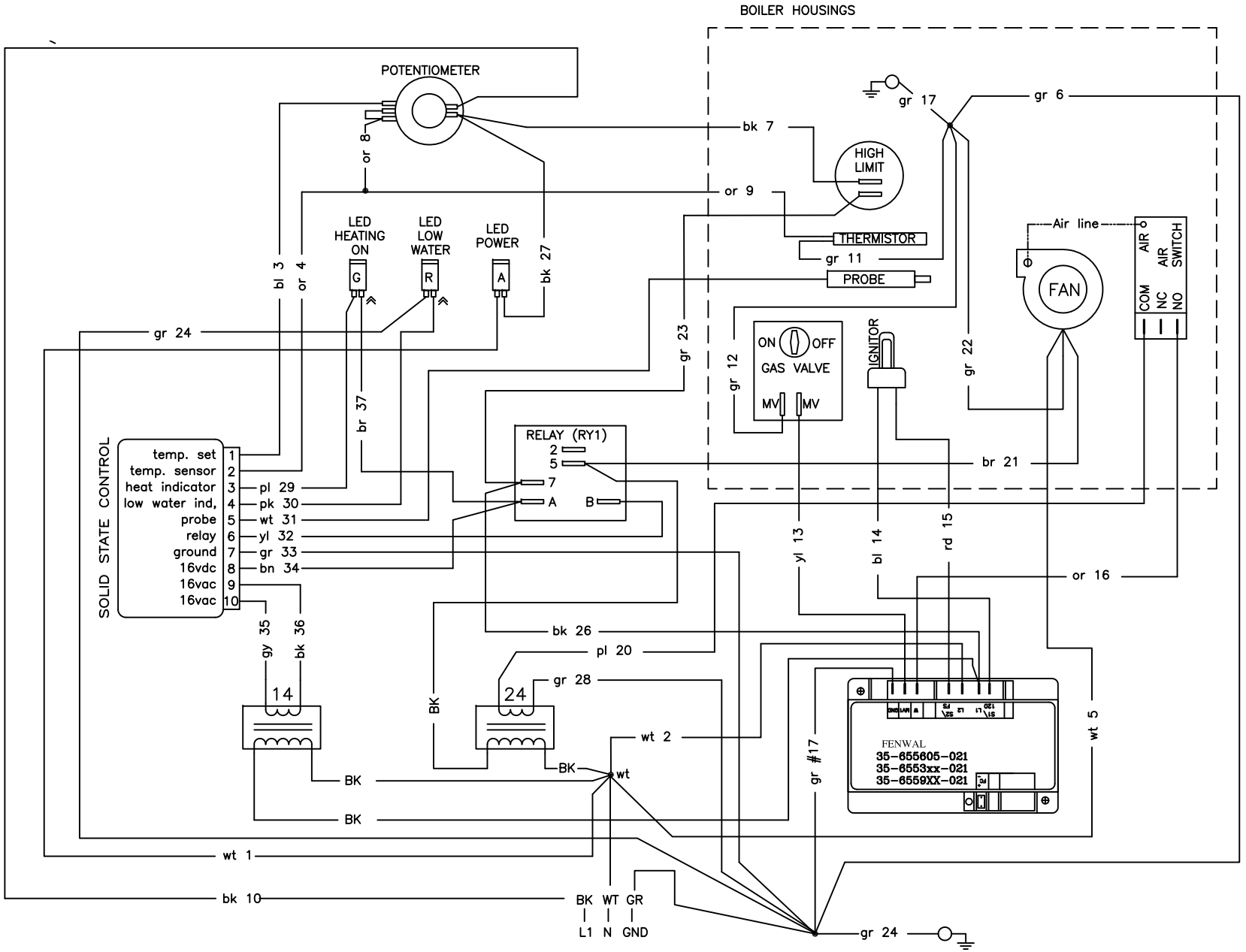



KE90407-2E




KE90407 REV. (I)

FLOOR GAS KETTLE (EXCEPT KGL–25/T) 110–120 VOLTS 60HZ


BOILER HOUSINGS
POTENTIOMETER
or 8
bk 7
or 9
gr 17
gr 6
HIGH LIMIT
THERMISTOR
gr 11
PROBE
Air line
AIR SWITCH
COM
NC
NO
FAN
LED HEATING ON
LED LOW WATER
LED POWER
G
R
A
bl 3
or 4
bk 27
gr 24
gr 23
gr 12
gr 22
ON
OFF
GAS VALVE
MV
MV
IGNITOR
br 37
RELAY (RY1)
2
5
7
A
B
br 21
SOLID STATE CONTROL
temp. set 1
temp. sensor 2
heat indicator 3
low water ind, 4
probe 5
relay 6
ground 7
16vdc 8
16vac 9
16vac 10
pl 29
pk 30
wt 31
yl 32
gr 33
bn 34
yl 13
bl 14
rd 15
or 16
gy 35
bk 36
bk 26
pl 20
gr 28
14
24
BK
BK
BK
wt
wt 2
wt 5
gr #17
FENWAL
35-655605-021
35-6553xx-021
35-6559XX-021
wt 1
bk 10
BK WT GR
L1 N GND
gr 24
MOUNTING PLATE

# *SPARE PARTS LIST*

The following is a spare parts listing of parts that wear during normal us or are apt to be misplaced during normal operation. These parts should be kept on hand to prevent loss time due to a minor problem.

| PART NUMBER | DESCRIPTION | QUANTITY |
|---|---|---|
| KE00458 | KETTLE SOLID STATE CONTROL BOX | 1 |
| KE50753-7 | RELAY, 120V | 1 |
| KE55069-6 | SAFETY THERMOSTAT | 1 |
| SE00114 | POTENTIOMETER WITH ON/OFF SWITCH, C/W ITEM #4 | 1 |
| KE50569-1 | KNOB, POTENTIOMETER | 1 |
| KE00515 | THERMISTOR | 1 |
| KE50580 | WATER RESISTANT BOOT | 1 |
| FA00012 | "O" RING, CIRCUIT BREAKER | 1 |
| KE50581 | BRIDGE RECTIFIER | 1 |
| KE50753-10 | RELAY | 2 |

The following is a recommended list of space parts that may be required if the service agency is of some distance away or if down time must be kept to a minimum and spare parts are required for the service agent on site.

| PART NUMBER | DESCRIPTION | QUANTITY |
|---|---|---|
| KE54941-5 | 1/2" FPT, 50 PSI., FOR ASME KETTLES | 1 |
| KE54941-31 | 1/2" FPT, 50 PSI., FOR CE KETTLE | 1 |
| KE53838-27 | TRANSFORMER, 120-14V. | 1 |
| KE53469 | IGNITION CONTROL | 1 |
| KE00458 | KETTLE SOLID STATE CONTROL BOX | 1 |
| KE53436 | AIR PRESSURE SWITCH | 1 |
| KE53838-20 | TRANSFORMER 120-24V | 1 |
| KE52752 | PISTON, TD-2 | 1 |
| SE50010 | PISTON, TD-3 | 1 |
| SE003013-1 | L.E.D., RED, Replacement Kit., (includes LED & "O" Ring) | 1 |
| SE003013-2 | L.E.D., GREEN, Replacement Kit., (includes LED & "O" Ring) | 1 |
| SE003013-3 | L.E.D., AMBER (Used prior to July 2004), Replacement Kit., (includes LED & "O" Ring) | 1 |
| KE50429-2 | PRESSURE GAUGE | 1 |
| KE53437 | IGNITOR | 1 |
| KE02053 | GAS VALVE ASSEMBLY (PRIOR TO MARCH 2005) | 1 |
| KE55240R | GAS VALVE ASSEMBLY (AFTER FEBRUARY 2005) | 1 |
| KE53137-3 | MOMENTARY SWITCH ACTIVATOR | 1 |
| KE53184 | CONTACT SECTION HOLDER (LATCH) | 1 |
| KE53138-1 | CONTACT BLOCK | 4 |

# SERIES 35-65

## 24 VAC Microprocessor Based HSI Control with 120/240 Field Selectable Line Voltage Capability

35-65,-66.02

## FEATURES

- Safe start and full-time flame sensing
- 120/240 field selectable line voltage for use with 120 VAC ignitor option
- 24/120/240 VAC hot surface ignitor models availab
- Blower control and airflow switch monitoring opti
- Diagnostic LED
- Multiple trials for ignition
- Automatic reset option
- Local or remote flame sensing
- Flame current test pins
- Dual speed blower option for LoNox applications
- Fail-safe gas valve control (35-66 only)
- CE models available


## APPLICATIONS

- Pool and spa heaters
- Gas furnaces
- Water heaters
- Any 24 VAC gas burner application under 400K BTU

## DESCRIPTION

The Series 35-65 controls are designed to perform many gas-fired 24 VAC appliance functions in a single control, resulting in lower system cost. This series monitors the demand for heat, controls the combustion blower, monitors proper airflow, ignites and maintains the flame during heating, and provides diagnostic support. The on-board diagnostics with LED output provide assistance with troubleshooting and ensures safe and efficient burner operation.

The microprocessor circuit design provides precise, repeatable timing sequences for ignition and purge times (pre-, inter-, and post-) as well as multiple tries for ignition. The optional 120/240 VAC field selectable line voltage capability provides additional field service efficiency and lower inventory costs.

### Agency Certifications

Design certified by CSA International to CAN C22.2 #199-M89 and ANSI Z21.20 for Automatic Ignition Systems, including UL1998 software review. FM approval and CE pending on selected models.

## SPECIFICATIONS

| | |
|---|---|
| INPUT POWER | |
| Voltage | Control: 18 to 30 VAC 50/60 Hz (Class 2 Transformer)<br>Line: 24, 120 or 240 VAC (L1 & L2 only) |
| Current | 300 mA max @ 24 VAC with blower and gas valve relay energized (Control only) |
| OUTPUT (CONTACT RATINGS) | |
| Gas Valve | 2.0A max @ 24 VAC |
| Combustion Blower (Model 35-66 only) | 3.0 FLA max @ 120 VAC (1/4 hp)<br>1.5 FLA max @ 240 VAC (1/4 hp) |
| Hot Surface Element | 5.0A max @ 120/240 VAC |
| OPERATING TEMPERATURE | -40ºF to +176ºF (-40ºC to +80ºC) |
| FLAME SENSITIVITY | 0.7 microamps minimum |
| TYPES OF GAS | Natural, LP, or manufactured |
| IGNITOR | 24 VAC, 120 VAC, or 240 VAC mini-ignitors and silicon carbide ignitors depending on model |
| ENCLOSURE | Gray (Noryl N-190) |
| MOISTURE RESISTANCE | Conformal coated to operate non-condensing to 95% R.H. Care must be taken to protect module from direct exposure to water |
| SIZE WITH ENCLOSURE | See Figures on Page 7 |
| WEIGHT | 8 oz including cover |

## SEQUENCE OF OPERATION / FLAME RECOVERY/ SAFETY LOCKOUT

### CALL FOR HEAT

#### 35-65 & 35-66 without Full-Time Power (R Terminal):

When a call for heat is received from the thermostat supplying 24 volts to the W terminal, the control will perform a self-check routine, flash the diagnostic LED for a second and begin the safety timing sequence. After an optional "pre-purge" period, the hot surface ignitor is energized for a heat-up period, followed by the gas valve for the "trial for ignition" (TFI) period.

#### Ignition - 35-65 Models:

When the flame is detected during the TFI period, the ignitor is de-activated and the gas valve remain energized. The thermostat and main burner flame are constantly monitored to assure that the system operates properly. When the thermostat is satisfied and the demand for heat ends, the gas valve is immediately de-energized.

### FAILURE TO LIGHT - LOCKOUT

#### Multi-try Models:

Should the main burner fail to light or the flame is not detected during the first TFI period, the gas valve is de-energized and the control performs an optional "inter-purge" delay before attempting another TFI period. The control will attempt 2 additional TFI's periods before locking out. In lockout, the gas valve will be turned off immediately. For 35-66 models, the combustion blower will be turned off following an optional "post-purge" period. With the 1 hour reset option, if the thermostat is still calling for heat, the control will automatically reset and attempt a new TFI sequence after one hour.

#### Lockout Recovery:

Recovery from lockout requires a manual reset by either resetting the thermostat or by removing the 24 volts for a period of 5 seconds.

#### Loss of Flame - Re-igntion:

If the established flame signal is lost while the burner is operating, the control will respond within 0.8 seconds. The gas valve is de-energized immediately and a new TFI sequence begins. If the burner does not relight, the control will lockout as previously described in the "Failure to Light - Lockout" section. Multi-try models will make 2 more attempts to light the burner. If flame is re-established, normal operation resumes.

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## MOUNTING AND WIRING

The 35-65 and 35-66 models are not position sensitive and can be mounted vertically or horizontally. The control may be mounted on any surface and fastened with #6 sheet metal screws. Secure the control in an area that will experience a minimum of vibration and remain below the maximum ambient temperature of 80°C (175ºF).

All connections should be made with UL approved, 105°C (221°F) rated 18 gauge, stranded wire with .054" minimum insulation. Refer to wiring diagram on Pages 5 or 6 when connecting the control to other components in the system.

### Terminal Designations

| TERMINAL | DESCRIPTION | TERMINATION |
|---|---|---|
| R | 24 VAC supply to processor (optional full time power) | ¼ in. Quick Connect |
| W | Thermostat Input | ¼ in. Quick Connect |
| L1 | 120/240VAC Input (Hot) | ¼ in. Quick Connect (or 5-pin Mate-N-Loc) |
| L2 | Neutral | ¼ in. Quick Connect (or 5-pin Mate-N-Loc) |
| GND | System Ground | ¼ in. Quick Connect |
| GV | Gas Valve | 3/16 in. Quick Connect |
| FS | Remote Flame Sense | ¼ in. Quick Connect |
| S1 - 120 | 120 VAC Ignitor | ¼ in. Quick Connect |
| S2 | Ignitor | (or 5-pin Mate-N-Loc) |
| S1 - 240 | 240 VAC Ignitor | ¼ in. Quick Connect (or 5-pin Mate-N-Loc) |
| FC+ & FC- | Flame Current Test Pins | ¼ in. Quick Connect |

Flame Fault (Full Time Power Models Only):

During normal sequence if an erroneous flame signal occurs, due to the gas valve failing to close completely, the controller will energize the combustion blower. Should the gas valve later close completely and the flame signal be removed, the combustion blower will power off following an optional post-purge period.

## FAULT CONDITIONS

| LED INDICATION | FAULT MODE |
|---|---|
| Steady On | Internal Control Failure |
| 1 Flash | **NA** |
| 2 Flashes | Erroneous Flame Signal |
| 3 Flashes | Lockout |

**CAUTION:**
Operation outside specifications could result in failure of the Fenwal product and other equipment with injury or death to people and damage to property. Service to this product should only be performed by a qualified technician.

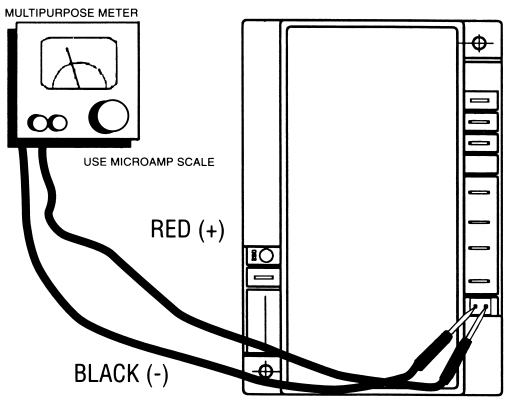
**CAUTION:**
Label all wires prior to disconnection when servicing the control. Wiring errors can cause improper and dangerous operation.

## TROUBLESHOOTING GUIDE

| SYMPTOM | RECOMMENDED ACTIONS |
|---|---|
| 1. Does not start | A. Miswired<br>B. 24 VAC Transformer bad<br>C. Fuse/Circuit breaker bad<br>D. Bad control, check LED for steady on or flashing codes |
| 2. Thermostat on - no ignition | A. Miswired<br>B. Bad thermostat, no voltage at thermostat terminal W<br>C. Failed ignitor |
| 3. Valve on - no ignitor | A. Defective ignitor<br>B. Miswired<br>C. Bad control, check voltage at ignitor |
| 4. Ignitor on - no valve | A. Valve coil open<br>B. Open valve wire<br>C. Bad control, check voltage at gas valve terminal |
| 5. Flame okay during TFI - no flame sense after TFI | A. Bad ignitor<br>B. Bad S1 wire<br>C. Poor ground at burner<br>D. Poor flame, check flame current |

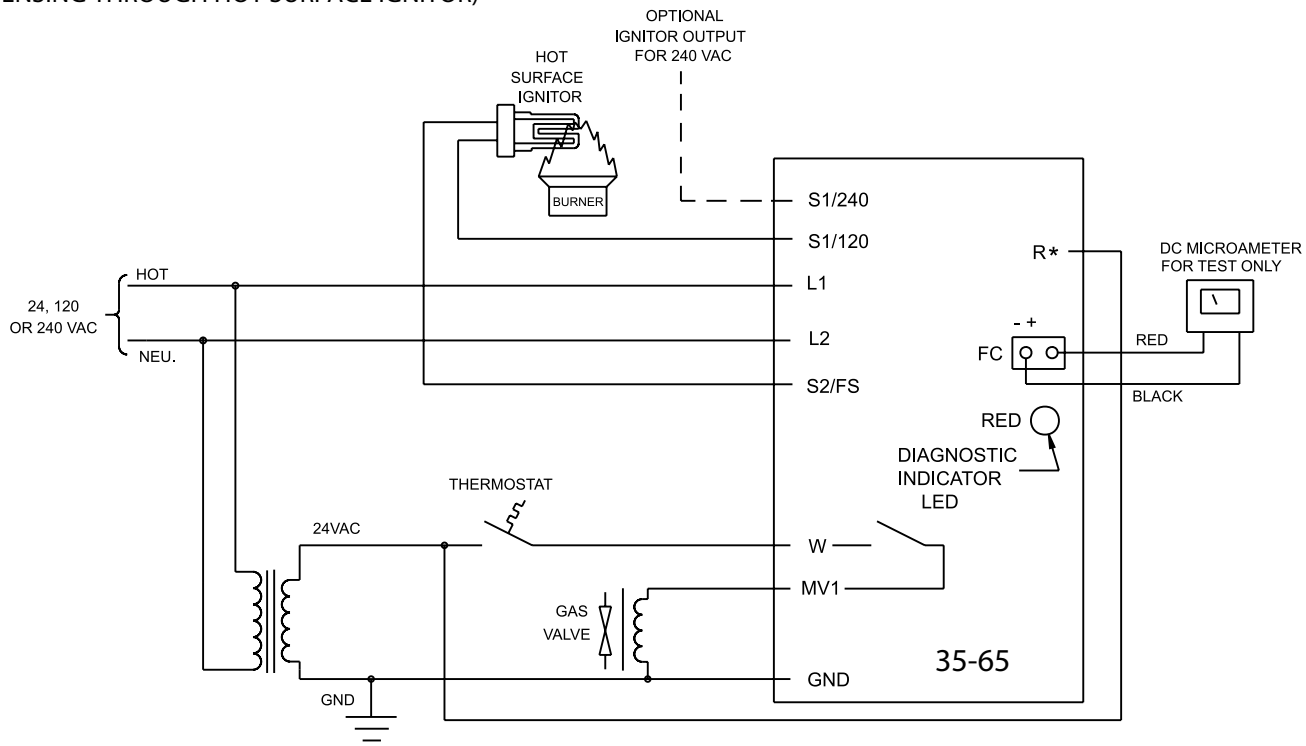
Flame current is the current that passes through the flame from the sensor to ground. The minimum flame current necessary to keep the system from lockout is 1 microamp. To measure flame current, connect an analog DC microammeter to the FC terminals per diagram below. Meter should read 1 microamp or higher. If meter reads below "0" on scale, meter leads are reversed. Disconnect power and reconnect meter leads for proper polarity

## FLAME SENSOR CURRENT CHECK



## WIRING DIAGRAMS - SERIES 35-65

### LOCAL FLAME SENSING
### (SENSING THROUGH HOT SURFACE IGNITOR)




* R TERMINAL IS ONLY USED ON CONTROLS WITH FULL TIME POWER

## DIMENSIONS - SERIES 35-65,

### FRONT AND SIDE VIEWS