



# YOUR GUIDE TO MAINTAINING TUTTNAUER™ M/MK SERIES & VALUEKLAVE MKV STERILIZERS

Replacement Parts Industries, Inc. is pleased to present this valuable work tool that can help save you and your customers time and money. Take a look, you will find Troubleshooting Guides, diagrams, exploded views and a complete listing of all RPI parts that fit all **1730/2340/2540/3870 M/MK and Valueklave™ 1730 MKV** Tuttnauer models. It's all here, in one easy-to-use tool. Keep it close by—in your RPI catalog or at your workbench.

**PLEASE NOTE!**

Over the years, Tuttnauer has substituted parts from what has been noted in their manuals. As a precaution, please verify parts before replacing or servicing them.

## LEVELING & FILLING PROCESS

### LEVELING THE STERILIZER

1. The sterilizer must be placed on a level surface.  
**Note:** When positioning the sterilizer on the surface, be sure to keep the back and right side of the sterilizer approximately 1" (25mm) away from the wall to allow for proper ventilation.

2. To check if the sterilizer is level: Refer to **Table A, to the right**; measure only the amount of water indicated in the chart for the corresponding model into a measuring cup; and, pour the measured water into the chamber. The water must reach the indication groove near the front of the chamber. Refer to **Figure 1, to the right**.

If the water does not reach or it goes past the groove, the sterilizer is not level and must be adjusted. To help level the sterilizer, the front legs of the sterilizer may be adjusted using a wrench.

### FILLING THE RESERVOIR

1. Use distilled water only to fill the reservoir. Fill the reservoir until the water level is 1" (25mm) below the base of the Safety Valve Holder. Refer to the Min/Max lines on the Reservoir Dip Stick.

**Caution!** For proper operation of the sterilizer, do not fill water above the Safety Valve Holder.

**FIGURE 1**

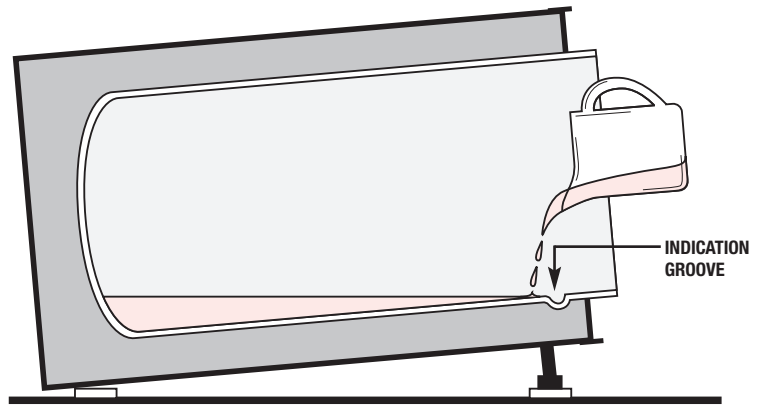
### LEVELING THE STERILIZER

To verify that the sterilizer is level, the amount of water (as indicated in **Table A, to the right**) when poured into the chamber must reach the indication groove inside the chamber.

**TABLE A**

AMOUNT OF WATER NEEDED, TO CHECK IF STERILIZER IS LEVEL.

| Model                             | Amount of Water            |
|-----------------------------------|----------------------------|
| 1730 Series & Valueklave 1730 MKV | 10 - 12 oz. (300 - 355 ML) |
| 2340 & 2540 Series                | 12 - 15 oz. (355 - 444 ML) |
| 3870 Series                       | 24 - 27 oz. (710 - 798 ML) |



## PLANNED MAINTENANCE

**CAUTION!**

*Before starting any maintenance or repairs:* **1)** Turn the sterilizer OFF. **2)** Unplug the power cord from the wall outlet. **3)** Verify that there is **no** pressure in the unit. **4)** Wear appropriate protective hand and eye gear.

|                 |  |
|-----------------|--|
| <b>DAILY</b>    | Clean the Door Gasket with a soft cloth or sponge using a soft liquid detergent and water. Rinse well and leave no residue.  |
| <b>WEEKLY</b>   | <ul style="list-style-type: none"> <li>1. Remove the Trays and Tray Holder from the unit. Clean the Chamber, Tray Holder and Trays with a cloth or sponge using an OEM recommended cleaner. <b>Caution: Do not use steel wool, a steel brush or chlorinated cleansers on these parts.</b></li> <li>2. Thoroughly rinse Chamber, Tray Holder, and Trays with clean water. Flush the Chamber. Flush the Fill hole located at the back of the Chamber by turning the Fill Knob to the FILL position for a couple of seconds.</li> <li>3. Dry the Chamber, Tray Holder and Trays, and reinstall.</li> <li>• Place a couple of drops of oil on the two door pins and the door tightening bolts.</li> <li>• Clean the outside of the unit with a soft cloth or sponge using a non-abrasive cleaner.</li> <li>• Drain and flush the Water Reservoir while using a baby bottle brush to clear any build up of debris. Refill the reservoir (see <b>FILLING THE RESERVOIR, above</b>).</li> <li>• When the sterilizer is cold and not pressurized, verify the integrity of the Spring and Plunger Assembly by pulling and releasing the end ring on the Safety Valve – it should spring back.</li> <li>• Remove and clean Chamber Filters.</li> <li>• Check and clean the Air Jet Valve by moving the wire back and forth several times to prevent debris buildup.</li> </ul> |
| <b>MONTHLY</b>  | <p><b>Caution: During this procedure, be prepared for a rush of steam to be released with a loud hissing sound. Wear appropriate protective hand and eye gear.</b></p> <p>During a sterilization cycle, use an insulated tool or pair of needle nose pliers to pull on the end ring of the Safety Valve, and let the steam exhaust for a couple of seconds. This will remove debris in the lines and clean the valve's orifices. Verify its closing ability.</p>   |
| <b>ANNUALLY</b> | Recommended parts to be replaced at this time include the Door Gasket, Chamber Filters, Door Bellows, and parts showing wear.  |

# ELECTRICAL TROUBLESHOOTING & WIRING DIAGRAMS

## BASIC CIRCUIT INSPECTION

1. Disconnect power to unit.
2. Set sterilizer controls to the following settings:
  - Circuit Breaker = ON
  - Power Switch = ON
  - Sterilizer Door = CLOSED
  - Timer = Set for more than 10 minutes
  - Temperature Controller = Set at 250° or higher
3. Set a multi-meter to ohm scale, then connect the line and neutral terminals of the power module.
4. Rotate the Multi-Purpose Valve to each setting; starting and ending at 0, and observe the meter for the following:
  - In the STE and EXH+DRY positions, the meter should read the circuit values ( $\pm 10\%$ ) shown in **Table B, below** for each model. If the meter reads a much higher resistance than shown in Table B, it is an indication of an open circuit. If the reading is significantly lower than shown in Table B, it is an indication of a short circuit or heater burnout.
  - In the 0 and FILL positions, the meter should read a very high resistance – which indicates an open circuit.
5. Remove unit's covers and insulation blanket. Perform a full visual inspection of wiring, terminals and connections. Inspect the wiring harness

**SERVICE TIP**  
 When working on the electrical system, follow all safety requirements.

- for loose leads and broken or damaged wires. Make any repairs and retest. If no defects found, then inspect each component and conduct continuity check of the complete wiring circuit.
6. Refer to the schematic in **Figure 2, below**, check each circuit component, starting with the circuit breaker. Take note of the following characteristics for each of the components:
    - Safety Thermostats should be closed except at high temperature when they open to protect the circuit. **Note:** Models built after January, 1993 have dual Safety Thermostats, one of which has a manual reset button and is located near the circuit breaker.
    - Timer must be turned **past 10 minutes** to make contact and provide electrical continuity.
    - Control Thermostat must be set above 212° F to make contact and provide electrical continuity.
    - Micro-Switch positions and wiring are referenced on **page 9, MULTI-PURPOSE VALVE & MICRO-SWITCHES**. (Note: Micro-Switches are best checked with an analog ohm meter.)
    - Heater element resistance values are shown in **Table C, below**.
  7. Repair or replace all faulty circuits or components, then retest unit.
  8. Replace insulation blanket and reinstall covers.
  9. Run unit for several cycles and check all operations.

**TABLE B - APPROXIMATE CIRCUIT VALUES ( $\pm 10\%$ ) AT STE AND EXH-DRY POSITIONS**

| Model                | VAC | STE Amps | STE Ohms | EXH-DRY Amps | EXH-DRY Ohms |
|----------------------|-----|----------|----------|--------------|--------------|
| 1730M                | 120 | 9.5      | 13.0     | 2.0          | 60           |
| 1730M                | 230 | 4.8      | 48.0     | 1.2          | 218          |
| 1730MK               | 230 | 6.0      | 38.0     | 1.3          | 170          |
| 1730MKV (Valueklave) | 120 | 13.0     | 9.0      | 3.0          | 40           |
| 2340M                | 120 | 13.0     | 9.5      | 3.2          | 38           |
| 2340M                | 230 | 6.5      | 35.0     | 1.6          | 140          |
| 2340MK               | 230 | 11.5     | 21.0     | 2.8          | 90           |
| 2540M                | 120 | 13.0     | 9.0      | 3.2          | 38           |
| 2540M                | 230 | 6.5      | 35.0     | 1.6          | 140          |
| 2540MK               | 230 | 11.5     | 9.5      | 2.8          | 90           |
| 3870M                | 230 | 12.0     | 19.0     | 3.2          | 76           |

**TABLE C - APPROXIMATE HEATER ELEMENT RESISTANCE VALUES ( $\pm 10\%$ )**

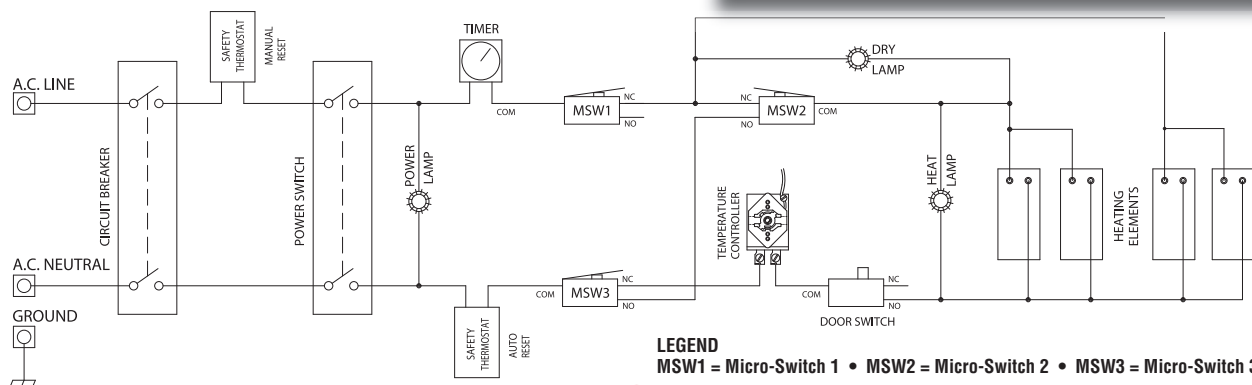
| Model                | VAC | Watts | Resistance (Ohms) |
|----------------------|-----|-------|-------------------|
| 1730M                | 120 | 350   | 41                |
| 1730M                | 230 | 350   | 147               |
| 1730MK               | 230 | 450   | 117               |
| 1730MKV (Valueklave) | 120 | 450   | 32                |
| 2340M                | 120 | 350   | 41                |
| 2340M                | 230 | 350   | 147               |
| 2340MK               | 230 | 550   | 96                |
| 2540M                | 120 | 350   | 41                |
| 2540M                | 230 | 350   | 147               |
| 2540MK               | 230 | 550   | 96                |
| 3870M                | 230 | 1000  | 112               |

**FIGURE 2**

**Schematic of Current Tuttnauer Models 2340M/MK & 2540M/MK** Although the schematic below applies to the current 2340M/MK & 2540M/MK Models of Tuttnauer sterilizers, it can be used as a reference for all of the other manual models as well. Variations to the wiring of manual models is common among Tuttnauer sterilizers. For a list of the variations that might be encountered when servicing these sterilizers, **see the listing to the right.**

**Variations Between Tuttnauer M/MK/MKV Wiring**

- Single vs. Dual Circuit Breakers
- Circuit Breaker(s) or Fuse
- Single or Dual Thermostat
- Wiring of Thermostat (Manual or Automatic reset)
- Wiring of Heat Light or Dry Light
- With or without Door Switch
- Number of Heating Elements required



**LEGEND**  
 MSW1 = Micro-Switch 1 • MSW2 = Micro-Switch 2 • MSW3 = Micro-Switch 3

# WATER/STEAM SYSTEM TROUBLESHOOTING

Water and steam leaks not only cause damage to the site where the unit is located but also, will create a low water condition resulting in overheating that could cause major damage to the autoclave.

## SERVICE TIP

To help prevent clogging of the MPV, install RPI Filters (RPI Part #MIF062) into the Water Fill and Exhaust Lines.

## ISOLATING LEAKS & CORRECTIVE ACTION

Visual and audible leaks can be detected by operating the sterilizer in the normal STE mode with temperature set at 273° F and the time set for **30 minutes on M units** and **15 minutes on MK & Valueclave 1730 MKV units**. Possible points of water/steam leaks with corrective action, and order in which they should be checked are noted in #1-5 below.

### SERVICE TIP

If the Chamber is found to be defective, tag it as "Out of Operation". Removal of the power cord is recommended until the chamber is replaced.

## 1 DOOR GASKET & DOOR BELLOWS

Check chamber Door Gasket for any steam leaks, hissing, or water bubbles at the Door Bellows. If steam is leaking at the door closing device, then rotate the Gasket 180° to see if the leak follows it. If the leak follows the Gasket, then replace the Gasket. If the leak does not follow the Gasket, then replace the Door Bellows.

## 2 SAFETY VALVE

Remove the Water Reservoir Fill Cover and visually inspect the Safety Valve – use a dental mirror to help locate the leak. Confirm that there is no steam or water drops escaping from the vent holes or threads of the Safety Valve. If a leakage is observed, replace the Safety Valve.

## 3 AIR JET VALVE

Inspect the Air Jet Valve. It should make a slight hissing sound throughout the STE cycle. If there is excessive hissing, steam, or water bubbles escaping from the Air Jet Valve, refer to **HOW TO CHECK THE AIR JET VALVE, at the top right hand side of this page**. **Service Tip:** Use a dental mirror to help locate the leak.

If a water/steam leak is not related to #1-3 above, disconnect power from the sterilizer and remove the cover, then carefully remove the insulation blanket. Proceed to #4-5, below. **Warning!** Make sure power has been disconnected prior to removing the cover. When running the sterilizer with the cover removed, the interior of the machine will be very hot - use extreme caution.

## 4 MULTI-PURPOSE VALVE

Inspect the Multi-Purpose Valve for leakage. Note any leaks at the three fittings or the valve stem. If none are found, disconnect the Condensation Coil in the water reservoir at the point where it connects inside the reservoir. Operate the sterilizer in STE mode at 273°F for **30 minutes on M units** and **15 minutes on MK & Valueclave 1730 MKV units**, and look for any signs of leakage back into the reservoir from the tubing fitting where the Condensation Coil was attached. Inspect the water fill tube at the bottom of the reservoir for any signs of steam bubbling back into the reservoir. If any leakage is noted at either position, repair or replace the Multi-Purpose Valve. **Important:** Reconnect Condensation Coil before exhausting Chamber pressure.

## 5 CHAMBER & INTERNAL TUBING

Carefully inspect for steam or water bubbles at the Chamber and all fittings. If a leak is detected at one of the fittings or tubing, tighten or replace only after the unit has been depressurized and allowed to cool down.

## HOW TO CHECK THE AIR JET VALVE

1. Refer to **Table A, page 1**, and in a measuring cup, fill it with the amount of water indicated in the chart for the corresponding model, then pour the measured water into the Chamber.
2. Bypass the FILL setting to manually run sterilizer in STE mode at 273°F for **30 minutes for M units** and **15 minutes for MK & Valueclave 1730 MKV units**. After 30 minutes (or 15 minutes), shut off power, but leave MPV in STE mode until chamber pressure is reduced to 0 PSI and chamber has cooled (approx. 15 minutes).
3. Open Chamber Door, siphon water back into the measuring cup, and measure the amount of water remaining in the chamber.
  - If remaining water is less than 50% of the original volume and no other leaks were detected, replace Air Jet Valve.
  - If remaining water is greater than 50% and the pressure did not reach 28 psi within the nominal times (see **TABLE D, above**), and no fault was found within the heating system, then replace the Air Jet Valve.

**TABLE D**  
NOMINAL TIMES FOR REACHING 28 PSI

| Model           | Time from Hot Start | Time from Cold Start |
|-----------------|---------------------|----------------------|
| M Series        | 19 min.             | 24 min.              |
| MK Series & MKV | 6 min.              | 9 min.               |

## REMOVING OBSTRUCTIONS

### HOW TO UNCLOG THE MULTI-PURPOSE VALVE DURING A CYCLE

1. Refer to **Table A, page 1**, and pour the indicated amount of water into the sterilizer. Turn the power switch ON.
2. Close and lock the sterilizer door – be sure to make a tight seal and wait for the heat light to come on.
3. Set the sterilizer to the following settings: Multi-Purpose Valve (MPV) set to STE position; Timer Knob set to 20 minutes; and, Thermostats Knob to 273°F (134°C). Then press power switch to START. (Note: With the MPV in the STE position, heaters will be ON, and sterilizer will begin to build pressure.)
4. When the Chamber pressure reaches 30-31 PSI:
  - Turn the Power Switch to the OFF position.
  - Turn the MPV to the FILL position. Now the Chamber pressure should force out debris from the MPV through the Fill Line into the Reservoir.
  - When the pressure in the Chamber reaches 0, turn the MPV to the OFF position, then open the door. Allow the sterilizer to cool.
  - Clean out any debris from the inside of the Chamber.
  - If the MPV is still clogged, rebuild or replace it.

### HOW TO MANUALLY UNCLOG THE MULTI-PURPOSE VALVE

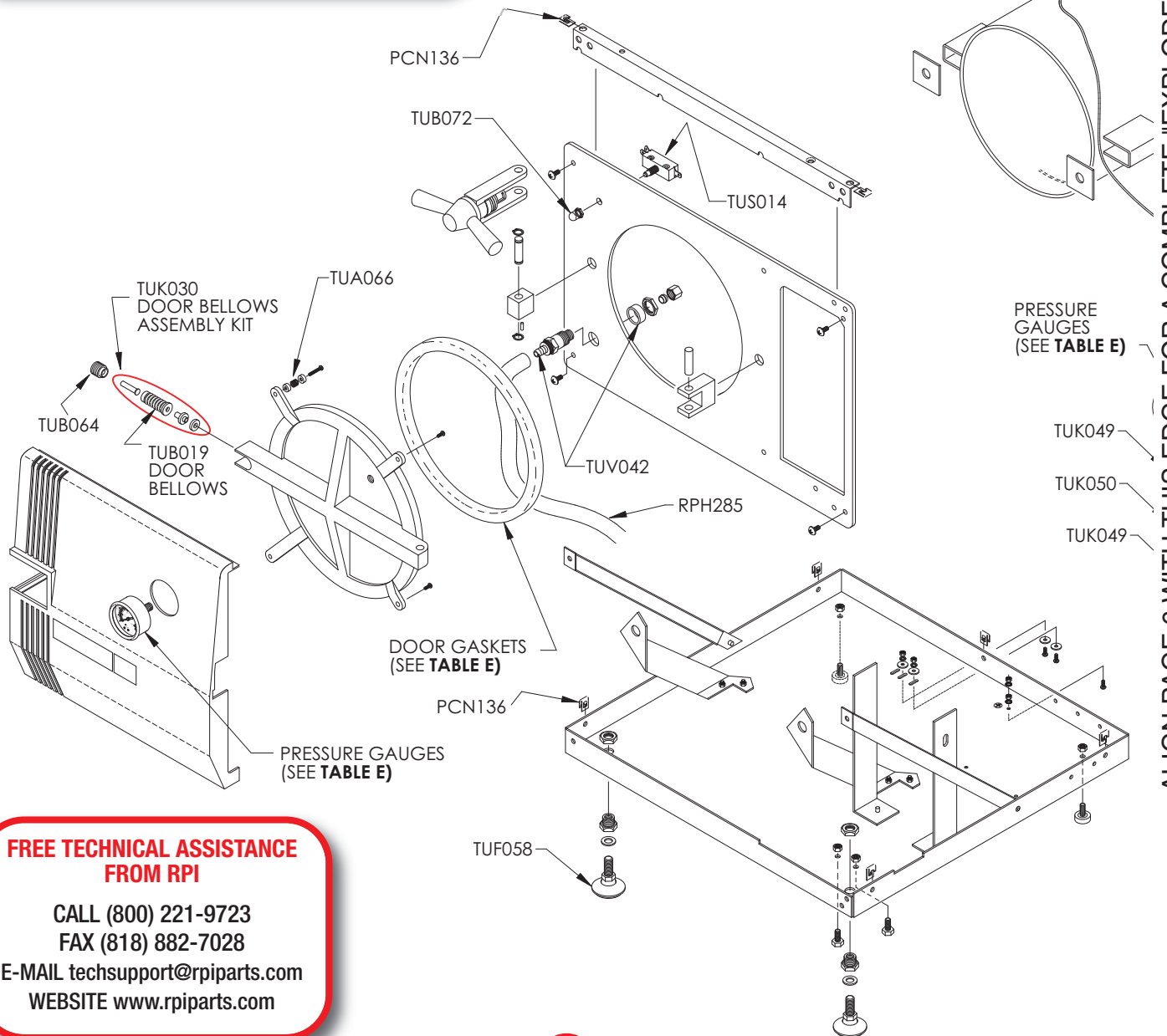
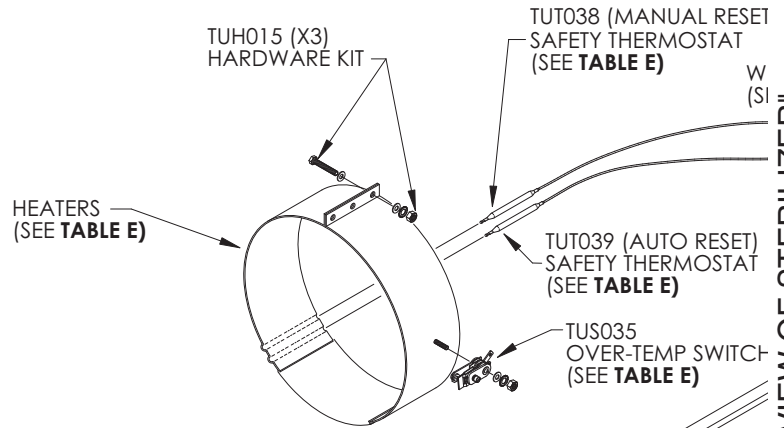
1. Disconnect power from sterilizer. Allow to cool. Remove covers.
2. At the center port of the Multi-Purpose Valve (MPV), disconnect the fitting. Set MPV to the FILL position. **Service Tip:** Drain most of the water from the Reservoir to prevent excess spillage during this process. This will also verify that the Drain Tube and Drain Valve are clear.
  - If water flows into the Chamber, then the obstruction has been cleared from MPV and Fill Tube.
  - If water does not flow into the Chamber, check Fill Tube as follows: Disconnect Fill Tube fitting at bottom of MPV.
    - If water flows, Fill Tube is clear, but MPV must be rebuilt or replaced.
    - If water does not flow, use forced air through Fill Tube and check for bubbles in Reservoir. If procedure does not clear obstructions, replace Fill Tube. **Service Tip:** When disconnecting Fill Tube, straighten portion of tube (about 1" lg.) that protrudes into the bottom of Reservoir. Support Reservoir boss with a wrench.
3. If MPV and Fill Tube are clear, next check Chamber Tube as follows: Disconnect and remove MPV from Chamber Tube. Use forced air or water through tube. If procedure does not clear obstructions, replace Chamber Tube. Also check and clear Chamber Fitting and boss of any obstructions.
4. Check exhaust lines as follows: At the top port of MPV, disconnect Condensing Coil Tube, see **MULTI-PURPOSE VALVE, page 9**. Force air through tube. If the flow is blocked, determine whether Condensing Coil or Tube is obstructed. Clear obstruction or replace coil and/or tube.
5. If no leaks or obstructions have been found by following the previous steps, and sterilizer is still experiencing a low water condition resulting in over-heating problems, see **HOW TO CHECK THE AIR JET VALVE, above**.

## TROUBLESHOOTING

| SYMPTOM   | CAUSE  | SOLUTIONS   |
|---|--|---|
| Power-On Light does not illuminate                                      | Wall outlet or plug  | Verify power at outlet. Make sure power cord is plugged in at the wall and at the machine.  |
|   | Power Switch   | Turn <b>Power Switch</b> ON. Replace if necessary.  |
|   | Circuit Breaker  | Reset breaker. Check for short circuit (see <b>page 2</b> ). If no short is found, replace <b>Circuit Breaker</b> .   |
|   | Power Lamp   | Replace <b>Power Light</b> .  |
|   | Open Circuit   | Check for loose or disconnected wires. Replace <b>Wire Harness</b> , if necessary.  |
| Heat Lamp OFF in STE cycle  | Timer  | Check that <b>Timer</b> is turned ON. Timer must be advanced <b>past 10 minutes</b> to activate.  |
|   | Heat Lamp  | If unit has heat and pressure, check and/or replace <b>Heat Lamp</b> . If unit has <u>no</u> heat, check for open circuit (see <b>page 2</b> ).   |
|   | Micro-Switch 1 (MSW1) is defective or it is stuck in the <b>down</b> position. | Check <b>MSW1</b> . Adjust or replace as necessary.   |
|   | Control Thermostat   | Set <b>Control Thermostat</b> to 212°F or higher. Adjust or replace <b>Control Thermostat</b> as necessary.   |
| Heat lamp is ON; No heat or pressure                                    | Heaters  | Measure <b>Heater</b> for proper resistance, see <b>Table C, page 2</b> . Check for broken/disconnected wiring. Replace if necessary.   |
| Heat lamp is ON in STE cycle, but with low heat and slow pressure build | Steam Leak   | Check for audible/visual steam leak at <b>Door Gasket, Door Bellows, Safety Valve, Air Jet Valve, and Condensation Coil</b> . If there are air bubbles in reservoir, check <b>Multi-Purpose Valve</b> . Repair or replace faulty part(s) as necessary.                    |
|   | Heaters  | Measure <b>Heaters</b> for proper resistance, see <b>Table C, page 2</b> . Check for broken or disconnected wiring.   |
|   | Control Thermostat   | Set <b>Control Thermostat</b> to 212°F or higher. Adjust or replace <b>Control Thermostat</b> as necessary.   |
|   | Excess water in Chamber  | Check water level. Check level of unit per <i>Installation Procedure</i> , see <b>Figure 1, page 1</b> .  |
|   | Pressure Gauge   | Check and/or replace <b>Pressure Gauge</b> .  |
| Safety Valve opens  | Control Thermostat   | Reset <b>Control Thermostat</b> to proper value or, if necessary, replace it.   |
|   | Safety Valve   | If <b>Safety Valve</b> opens below rated cracking pressure, replace it.   |
| Unit overheats, Heat Light stays ON                                     | Water level  | Check fill operation and water level, see <b>Figure 1, page 1</b> .   |
|   | Water or steam leak  | Check for audible/visual steam leak at <b>Door Gasket, Door Bellows, Safety Valve, Air Jet Valve, and Condensation Coil</b> . If there are air bubbles in reservoir, check <b>Multi-Purpose Valve</b> . Repair or replace part(s) as necessary.                           |
| Unit overheats, Power and Heat Lights go out                            | Low water level (Over Temp Safety Switch)                                      | Check for water or steam leak. Replace <b>Over Temp Safety Switch</b> if necessary.   |
| Heat lamp remains ON when Timer is at 0 or Timer will not advance       | Timer  | <b>Timer</b> must be advanced <b>past 10 minutes</b> to activate. Check <b>Timer</b> operation and replace if necessary.  |
| Timer Bell does not sound   | Timer  | <b>Timer</b> must be advanced <b>past 10 minutes</b> to activate. Check <b>Timer</b> operation and replace if necessary.  |
| Water enters Chamber after unit is exhausted and the door is closed     | Condensation Coil  | Water level is above open end or there is a hole in the <b>Condensation Coil</b> creating a vacuum. Reduce water level to 1" below <b>Safety Valve</b> and open end of <b>Condensation Coil</b> must be above water level. Replace <b>Condensation Coil</b> if necessary. |
|   | Multi-Purpose Valve (if not stuck open)  | Remove, disassemble, clean and rebuild, or replace <b>Multi-Purpose Valve</b> (see <b>MULTI-PURPOSE VALVE, page 9</b> ).  |

**HEATING ELEMENTS SERVICE TIPS**

- When replacing a Heater, a burning smell may be present for several cycles. This is normal and does not indicate any malfunction of the new Heater.
- Current Heaters offered by RPI and Tuttnauer are designed to accommodate Safety Thermostats that use 3/16" diameter bulbs. When replacing the Heater band that mounts the Safety Thermostats to the Chamber, take a moment to measure the diameter of the Safety Thermostat bulbs. If the bulbs are 1/8" diameter (original style), then replace them with the newer style 3/16" diameter bulbs to ensure proper contact to the Chamber and the Heater band.
- Make sure that the bulb for the automatic reset Safety Thermostat is installed in the lower groove of the Heater band, and that the bulb for the manual reset thermostat is installed in the upper groove.
- When installing new Heater bands, tighten all bolts evenly until the band is snug against the Chamber. Run the sterilizer through several test cycles and then retighten the hardware to ensure proper fit. Failing to properly tighten Heater bands can lead to premature failure.



ALIGN PAGE 6 WITH THIS EDGE FOR A COMPLETE "EXPLODED VIEW OF STERILIZER"

**FREE TECHNICAL ASSISTANCE FROM RPI**

CALL (800) 221-9723

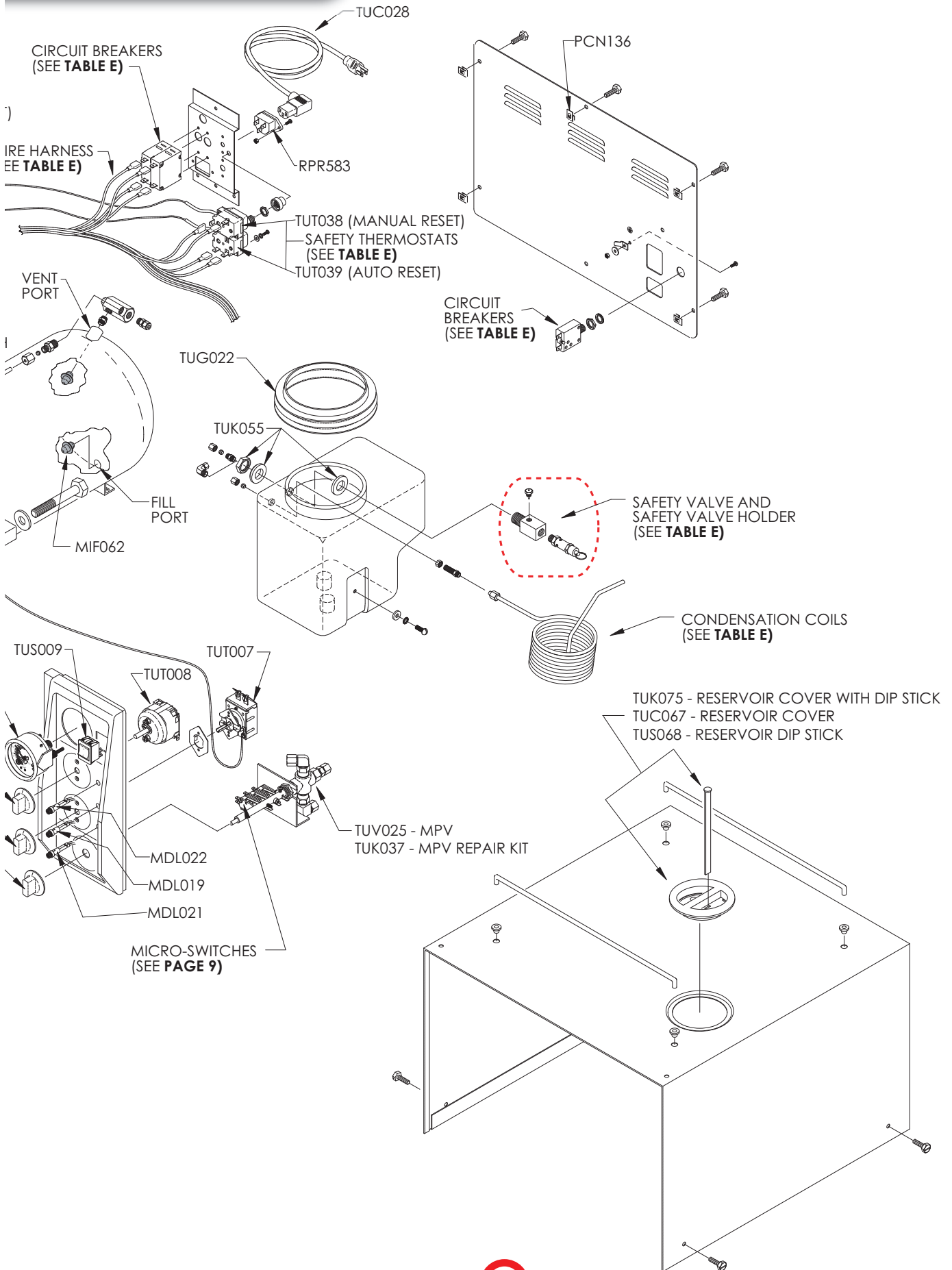
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# OF STERILIZER

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## TABLE E - QUICK REFERENCE

Various Part Options Available for Specific Models.

### CIRCUIT BREAKERS – PUSH BUTTON STYLE

| RPI Part # | Options |
|------------|---------|
| TUB048     | 7 AMPS  |
| TUB047     | 15 AMPS |

### CIRCUIT BREAKERS – LEVER STYLE

| RPI Part # | Options |
|------------|---------|
| TUB023     | 15 AMPS |
| TUB024     | 10 AMPS |

### CONDENSATION COILS

| RPI Part # | Options   |
|------------|---|
| TUC040     | Fits Models 1730M/MK  |
| TUC041     | Fits earlier models where coil joins reservoir at the left rear and vents towards the <u>front</u> of the machine.      |
| TUC063     | Fits newer models where coil joins reservoir at the left <u>front</u> and vents towards the <u>rear</u> of the machine. |

### GASKETS

| RPI Part # | Options                                       |
|------------|---|
| TUG001     | Fits Models 1730M/MK & Valueklave 1730 MKV    |
| TUG002     | Fits Models 2340M (Serial #8805 and below)    |
| TUG021     | Fits Models 2340M/MK (Serial #8806 and above) |
| TUG003     | Fits Models 2540M/MK                          |
| TUG074     | Fits Model 3870M                              |

### HEATER ELEMENTS & ATTACHING HARDWARE *(see page 2 for specs)*

| RPI Part # | Options   |
|------------|---|
| TUH027     | Fits Model 1730M                                  |
| TUH004     | Fits Model 1730MK & Valueklave 1730 MKV (120 VAC) |
| TUH016     | Fits Model 1730MK (230VAC)                        |
| TUH005     | Fits Model 2340M                                  |
| TUH017     | Fits Model 2340MK                                 |
| TUH006     | Fits Model 2540M                                  |
| TUH018     | Fits Model 2540MK                                 |
| TUH015     | Attaching Hardware fits all Models                |

### PRESSURE GAUGES

| RPI Part # | Options                               |
|------------|---------------------------------------|
| TUG020     | Smaller sized gauge (1-1/2" diameter) |
| TUG012     | Larger sized gauge (2-1/2" diameter)  |

### SAFETY THERMOSTATS & OVER TEMPERATURE SWITCH

| RPI Part # | Options   |
|------------|---|
| TUS035     | Over Temperature Switch (original style)        |
| TUT038     | Safety Thermostat (newer style-manual reset)    |
| TUT039     | Safety Thermostat (newer style-automatic reset) |

### WIRE HARNESES

| RPI Part # | Options                         |
|------------|---------------------------------|
| TUH043     | Fits Models 1730M/MK            |
| TUH044     | Fits Models 2340M/MK & 2540M/MK |

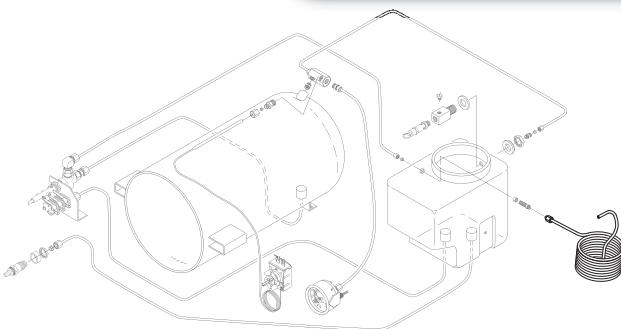
### SAFETY VALVES & SAFETY VALVE HOLDERS

| Description             | M<br>1730/2340/2540/3870 |                  | MK<br>1730/2340/2540 |                | MKV<br>Valueklave (1730) |
|-------------------------|--------------------------|------------------|----------------------|----------------|--------------------------|
|                         | 37 PSI                   | 40 PSI           | 37 PSI               | 40 PSI         | 40 PSI                   |
| Air Jet Valve           | TUJ034                   | TUJ034           | TUJ033               | TUJ033         | TUJ033                   |
|                         | <i>Black Top</i>         | <i>Black Top</i> | <i>Red Top</i>       | <i>Red Top</i> | <i>Red Top</i>           |
| Safety Valve Holder Kit | TUK054                   | TUK078           | TUK053               | TUK077         | TUK077                   |
| Safety Valve Holder     | TUH032                   | TUH032           | TUH031               | TUH031         | TUH031                   |
| Safety Valve            | TUV011                   | TUV065           | TUV011               | TUV065         | TUV065                   |
| Threaded Adapter        | TUA060                   | TUA060           | TUA060               | TUA060         | TUA060                   |
| Elbow Fitting           | TUF079                   | TUF079           | TUF079               | TUF079         | TUF079                   |
| Mounting Hardware       | TUK055                   | TUK055           | TUK055               | TUK055         | TUK055                   |

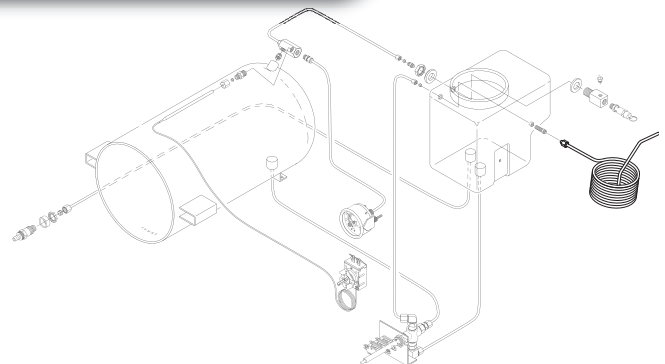
#### SERVICE TIP

When a Safety Valve needs replacement, replace it with the same rated PSI Valve – in other words, replace a 37 PSI valve with a 37 PSI valve, and a 40 with a 40. The PSI cracking pressure is actually etched onto the body of the Valve for your reference. (See **SAFETY VALVES & SAFETY VALVE HOLDERS**, to the left, for listing of parts and corresponding Models.)

## BASIC PLUMBING CONFIGURATIONS



**LEFT SIDE MULTI-PURPOSE VALVE MOUNT  
UNITS MANUFACTURED  
BEFORE 1993**



**RIGHT SIDE MULTI-PURPOSE VALVE MOUNT  
UNITS MANUFACTURED  
AFTER 1993**

## TROUBLESHOOTING

### Multi-Purpose Valve Assembly (MPV)

**IMPORTANT NOTE!** *Before working on the Multi-Purpose Valve or the Door Bellows:*

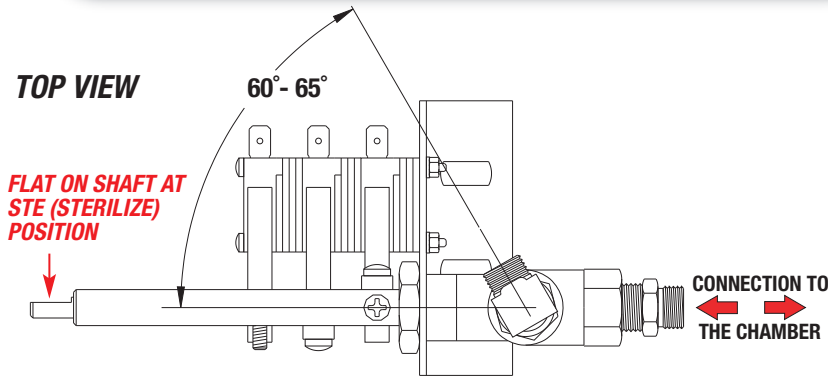
Turn the power **OFF**. Wear protective hand and eye gear. Use a tool such as a screwdriver or wrench (*do not use your fingers*) to *pull* the Safety Valve Pull Ring, and vent the Chamber to ZERO pressure. **Allow the unit to cool down.**

| SYMPTOM   | CAUSE  | SOLUTION  |
|---|--|---|
| MPV will not rotate.  | MPV is jammed.   | Remove, disassemble, clean and rebuild, or replace MPV. See <b>Important Note!</b> , above.   |
| MPV valve rotates in both directions.   | Broken Anti-rotational Spring Clip.  | Remove, disassemble, clean and rebuild, or replace MPV. See <b>Important Note!</b> , above.   |
| MPV will not exhaust in the EXH-DRY position; Pressure remains high                           | Clogged MPV, Condensation Coil, or MPV Tubing.                                 | Remove, disassemble, clean and rebuild, or replace MPV. See <b>Important Note!</b> , above.   |
| With power ON, MPV in EXH-DRY; Dry Light is OFF, but unit is drying properly                  | Dry Light malfunction.   | Replace Dry Light.  |
| With power ON, MPV in EXH-DRY; Unit is not drying properly                                    | Excess water in Chamber.   | If Chamber door is closed, then open the door 1" to allow for proper ventilation.   |
|   | Chamber over packed.   | Refer to Owners Manual for maximum load.  |
|   | Heater malfunction.  | Measure <b>Heater</b> for proper resistance, see <b>Table C, page 2</b> . Check for broken/disconnected wiring. Replace if necessary.   |
| In EXH-DRY position, Power Light is ON, Dry Light OFF, but unit is not drying                 | Timer not activated.   | Activate Timer by setting it <b>past 10 minutes</b> . If timer still does not activate, then replace Timer.   |
|   | Micro-Switch 1 (MSW1) is defective or it is stuck in the <b>down</b> position. | Set MPV to STE position, if Heat Light is OFF, adjust or replace <b>MSW1</b> . Refer to <b>MULTI-PURPOSE VALVE &amp; MICRO-SWITCHES, page 9</b> .   |
|   | Micro-Switch 2 (MSW2) is defective or it is stuck in the <b>down</b> position. | Set MPV to STE position, if Heat Light is OFF, adjust or replace <b>MSW2</b> . Refer to <b>MULTI-PURPOSE VALVE &amp; MICRO-SWITCHES, page 9</b> .   |
| In EXH-DRY position, Dry and Heat Lights OFF (Door open)                                      | Micro-Switch 3 (MSW3) is defective or it is stuck in the <b>up</b> position.   | Adjust or replace <b>MSW3</b> . Refer to <b>MULTI-PURPOSE VALVE &amp; MICRO-SWITCHES, page 9</b> .  |
| In EXH-DRY position, Circuit Breaker trips when Timer is set.                                 | Micro-Switch 2 (MSW2) is defective or it is stuck in the <b>up</b> position.   | Adjust or replace <b>MSW2</b> . Refer to <b>MULTI-PURPOSE VALVE &amp; MICRO-SWITCHES, page 9</b> .  |
|   | Short circuit in Wiring Harness.   | Check and replace <b>Wiring Harness</b> or repair shorted wire.   |
| With power ON, MPV in EXH-DRY position, all three lights ON (indicating unit is overheating). | Micro-Switch 3 (MSW3) is defective or it is stuck in the <b>up</b> position.   | Adjust or replace <b>MSW3</b> . Refer to <b>MULTI-PURPOSE VALVE &amp; MICRO-SWITCHES, page 9</b> .  |
| Door will not open after Chamber is exhausted and MPV is in the EXH-DRY position              | Door Bellows could be jammed.  | 1) See <b>Important Note!</b> , above. Then turn door closing device slightly clockwise to tighten, then turn counter clockwise to open.<br><br>2) See <b>Important Note!</b> , above. Remove covers. Carefully move the Insulation Blanket on the left side to expose the Chamber Tightening Bolt. Loosen Bolt until Door Locking Assembly is loose enough to open the Door. After the Door is open, tighten the Bolt and replace the Insulation Blanket. If necessary, replace <b>Door Bellows Assembly</b> . |
|   | Vacuum in Chamber (pressure below zero).                                       | See <b>Important Note!</b> , above. If this does not correct the situation, then check if MPV has blockage, see <b>page 3, REMOVING OBSTRUCTIONS</b> .  |

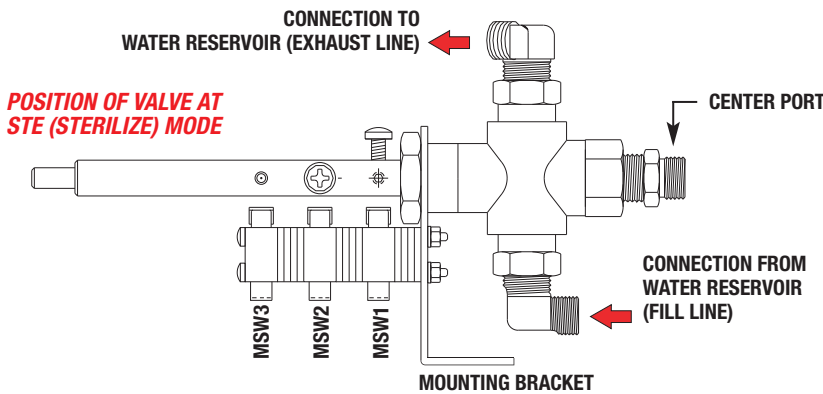
# MULTI-PURPOSE VALVE (MPV)

Illustrations shown below refer to side MPV mount only

### TOP VIEW



### SIDE VIEW



### NEW STYLE MICRO-SWITCH OPERATION

CLOSED = SWITCH ACTIVATED • OPEN = SWITCH NOT ACTIVATED

| VALVE POSITION | SWITCH OPERATION |        |        |
|----------------|------------------|--------|--------|
|                | MSW1             | MSW2   | MSW3   |
| 0              | CLOSED           | OPEN   | OPEN   |
| FILL           | CLOSED           | OPEN   | OPEN   |
| STE            | OPEN             | OPEN   | OPEN   |
| EXH-DRY        | OPEN             | CLOSED | CLOSED |

### STERILIZATION TIMES

Total Time from Start to Finish  
STE Temperature: 273°F (134°C)

#### M SERIES

CYCLE TYPE: Unwrapped  
COLD START: 30 minutes  
HOT START: 20 minutes

CYCLE TYPE: Wrapped  
COLD START: 40 minutes  
HOT START: 30 minutes

CYCLE TYPE: Packs  
COLD START: 45 minutes  
HOT START: 35 minutes

#### MK SERIES & VALUEKLAVE 1730 MKV

CYCLE TYPE: Unwrapped  
COLD START: 15 minutes  
HOT START: 12 minutes

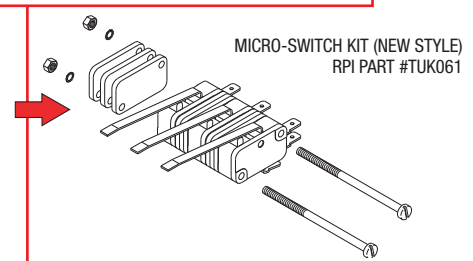
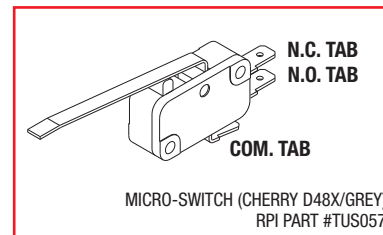
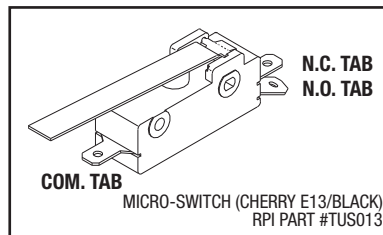
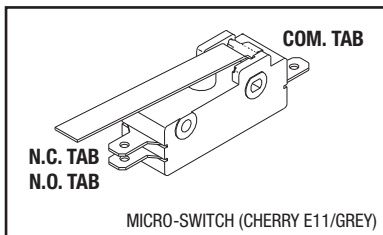
CYCLE TYPE: Wrapped  
COLD START: 20 minutes  
HOT START: 15 minutes

CYCLE TYPE: Packs  
COLD START: 25 minutes  
HOT START: 20 minutes

- The sterilization times noted above are based on the information sticker located on the unit's outer covering. If the voltage is significantly less than the voltage noted, then additional time must be added to each cycle to ensure proper functionality.

- Tuttnauer sterilizers tend to run a few degrees higher than the set temperature.

## MICRO-SWITCHES



**SERVICE TIP:** If unit is to be upgraded from the **old style** Micro-Switches (Cherry E11 or E13) to the **new style** Micro-Switch (Cherry D48X/Grey), then the Micro-Switch Kit (RPI Part #TUK061) must be used. The Kit includes the spacers and hardware that are necessary to upgrade from the old style to the new style Micro-Switches.



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LIST OF RPI PARTS AVAILABLE TO FIT  
 TUTTNAUER MANUAL UNITS AS OF JANUARY, 2008.

| RPI PART # | OEM PART #                | DESCRIPTION                                  | SEE FOOTNOTE | VALUE-KLAVE | 1730 | 2340 | 2540 | 3870 |
|------------|---------------------------|--|--------------|-------------|------|------|------|------|
| MDL019     | 01960007                  | SIGNAL LIGHT - RED (125VAC)                  |              |             | M    | M    | M    |      |
| MDL021     | 01910257                  | SIGNAL LIGHT - AMBER (125VAC)                |              | MKV         | M    | M    | M    |      |
| MDL022     | 01910258                  | SIGNAL LIGHT - GREEN (125VAC)                |              | MKV         | M    | M    | M    |      |
| MIF062     | (No OEM Part # Available) | FILL/VENT MESH CHAMBER FILTER                |              | MKV         | M MK | M MK | M MK | M    |
| RPC582     | 02819996                  | POWER CORD (220VAC)                          |              |             | MK   | MK   | MK   |      |
| RPH285     | 02620016A                 | DRAIN HOSE                                   |              | MKV         | M MK | M MK | M MK |      |
| RPO386     | 02610030/Inner            | O-RING (Drain Valve)                         |              |             | M MK | M MK | M MK |      |
| RPO387     | 02610027/Outer            | O-RING (Drain Valve)                         |              |             | M MK | M MK | M MK |      |
| RPR583     | 02819993                  | AC INLET RECEPTACLE                          |              | MKV         | M    | M MK | M MK | M    |
| TUA060     | (No OEM Part # Available) | THREADED ADAPTER (Fits Safety Valve Holder)  |              | MKV         | M MK | M MK | M MK | M    |
| TUA066     | CT312036                  | DOOR SWITCH ACTIVATOR                        |              | MKV         | M MK | M MK | M MK | M    |
| TUB019     | (No OEM Part # Available) | DOOR BELLOWS                                 |              | MKV         | M MK | M MK | M MK | M    |
| TUB023     | 01910098                  | CIRCUIT BREAKER (15A)                        |              | MKV         | M    | M    | M    |      |
| TUB024     | 01910097                  | CIRCUIT BREAKER (10A)                        |              |             | MK   | MK   | MK   |      |
| TUB047     | 01910100                  | CIRCUIT BREAKER (15A)                        |              |             | M MK | M MK | M MK | M    |
| TUB048     | 01910099                  | CIRCUIT BREAKER (7A)                         |              |             | MK   |      |      |      |
| TUB064     | CT245010                  | DOOR BELLOW HOUSING BOLT                     |              | MKV         | M MK | M MK | M MK | M    |
| TUB072     | (No OEM Part # Available) | RUBBER BOOT (Fits Door Switch)               |              | MKV         | M MK | M MK | M MK | M    |
| TUC028     | 02819995                  | POWER CORD (125VAC)                          |              | MKV         | M    | M    | M    | M    |
| TUC040     | CU836101                  | CONDENSATION COIL                            |              |             | M MK |      |      |      |
| TUC041     | CT836101                  | CONDENSATION COIL                            | 1            | MKV         |      | M MK | M MK |      |
| TUC063     | CT836101                  | CONDENSATION COIL                            | 1            |             |      | M MK | M MK |      |
| TUC067     | 02550019                  | WATER RESERVOIR/FILTER COVER                 |              | MKV         | M MK | M MK | M MK | M    |
| TUF079     | (No OEM Part # Available) | ELBOW FITTING (Fits Safety Valve Holder)     |              | MKV         | M MK | M MK | M MK | M    |
| TUG001     | 02610020                  | DOOR GASKET                                  |              | MKV         | M MK |      |      |      |
| TUG002     | 02610005                  | DOOR GASKET                                  | 2            |             |      | M    |      |      |
| TUG003     | 02610023                  | DOOR GASKET                                  |              |             |      |      | M MK |      |
| TUG012     | 02300011                  | PRESSURE GAUGE W/ INDICATOR (2-1/2")         |              |             | M MK | M MK | M MK | M    |
| TUG020     | 02300012                  | PRESSURE GAUGE (1-1/2")                      |              | MKV         |      |      |      |      |
| TUG021     | 02610118                  | DOOR GASKET                                  | 3            |             |      | M MK |      |      |
| TUG022     | 02610029                  | WATER RESERVOIR GASKET                       |              | MKV         | M MK | M MK | M MK | M    |
| TUG074     | 02610019                  | DOOR GASKET                                  |              |             |      |      |      | M    |
| TUH004     | 01720011                  | HEATER ELEMENT (120VAC, 450W)                |              | MKV         | M MK |      |      |      |
| TUH005     | 01720002                  | HEATER ELEMENT (120VAC, 350W)                |              |             |      | M    |      |      |
| TUH006     | 01720003                  | HEATER ELEMENT (120VAC, 350W)                |              |             |      |      | M    |      |
| TUH015     | (No OEM Part # Available) | ATTACHING HARDWARE (Fits Heaters)            |              | MKV         | M MK | M MK | M MK | M    |
| TUH016     | 01720012                  | HEATER ELEMENT (230VAC, 450W)                |              |             | MK   |      |      |      |
| TUH017     | 01720013                  | HEATER ELEMENT (230VAC, 550W)                |              |             |      | MK   |      |      |
| TUH018     | 01720014                  | HEATER ELEMENT (230VAC, 550W)                |              |             |      |      | MK   |      |
| TUH027     | 01720001                  | HEATER ELEMENT (120VAC, 350W)                |              |             | M    |      |      |      |
| TUH031     | CT841010                  | SAFETY VALVE HOLDER                          | 4            | MKV         | M MK |      | MK   | MK   |
| TUH032     | CT841020                  | SAFETY VALVE HOLDER                          | 4            |             | M    | M    | M    | M    |
| TUH043     | CU900012                  | WIRE HARNESS                                 | 5            |             | M MK |      |      |      |
| TUH044     | CT900012                  | WIRE HARNESS                                 | 6            |             |      | M MK | M MK |      |
| TUJ033     | CB842010                  | AIR JET VALVE (Red Top)                      | 4            | MKV         | MK   |      | MK   | MK   |
| TUJ034     | CT842010                  | AIR JET VALVE (Black Top)                    | 4            |             | M    | M    | M    | M    |
| TUK030     | CT241111                  | DOOR BELLOWS ASSEMBLY KIT                    |              | MKV         | M MK | M MK | M MK | M    |
| TUK037     | (No OEM Part # Available) | MULTI-PURPOSE VALVE REPAIR KIT               |              |             | M MK | M MK | M MK | M    |
| TUK049     | 02450002                  | TIMER & MULTI-PURPOSE VALVE KNOB             |              | MKV         | M MK | M MK | M MK | M    |
| TUK050     | 02450003                  | THERMOSTAT KNOB                              |              | MKV         | M MK | M MK | M MK | M    |
| TUK053     | (No OEM Part # Available) | SAFETY VALVE HOLDER KIT (37 PSI)             | 4            |             |      | MK   | MK   | MK   |
| TUK054     | (No OEM Part # Available) | SAFETY VALVE HOLDER KIT (37 PSI)             | 4            |             | M    | M    | M    | M    |
| TUK055     | (No OEM Part # Available) | MOUNTING HARDWARE (Fits Safety Valve Holder) |              | MKV         | M MK | M MK | M MK | M    |
| TUK061     | 01910197/Switch Only      | MICRO-SWITCH KIT                             |              | MKV         | M MK | M MK | M MK | M    |
| TUK075     | (No OEM Part # Available) | RESERVOIR COVER WITH DIPSTICK                |              | MKV         | M MK | M MK | M MK | M    |
| TUK077     | (No OEM Part # Available) | SAFETY VALVE HOLDER KIT (40 PSI)             | 4            | MKV         | MK   | MK   |      |      |
| TUK078     | (No OEM Part # Available) | SAFETY VALVE HOLDER KIT (40 PSI)             | 4            |             | M    | M    | M    | M    |
| TUS009     | 01910172                  | POWER SWITCH                                 |              | MKV         | M MK | M MK | M MK | M    |
| TUS013     | 01910191                  | MICRO-SWITCH (CHERRY E13/BLACK)              |              |             | M MK | M MK | M MK | M    |
| TUS014     | 01910190                  | DOOR SWITCH                                  |              | MKV         | M MK | M MK | M MK | M    |
| TUS035     | 01620301                  | OVER TEMPERATURE SAFETY SWITCH               | 7            |             | MK   | MK   | MK   |      |
| TUS057     | 01910197                  | MICRO-SWITCH (CHERRY D48X/GREY)              |              | MKV         | M MK | M MK | M MK | M    |
| TUS068     | 2550043                   | WATER RESERVOIR DIP STICK                    |              | MKV         | M MK | M MK | M MK | M    |
| TUT007     | 01620101                  | CONTROL THERMOSTAT                           |              | MKV         | M MK | M MK | M MK | M    |
| TUT008     | 01910011                  | TIMER (Old OEM Part #01910005)               |              |             | M MK | M MK | M MK | M    |
| TUT038     | 01620004                  | SAFETY THERMOSTAT (MANUAL RESET)             |              |             | M MK | M MK | M MK | M    |
| TUT039     | 01620103                  | SAFETY THERMOSTAT (AUTOMATIC RESET)          |              |             | M MK | M MK | M MK | M    |
| TUT073     | TEST-3                    | TAP (3/8-19 BSPP)                            |              | MKV         | M MK | M MK | M MK | M    |
| TUV011     | 03110003                  | SAFETY VALVE (37 PSI)                        | 4            |             | M MK | M MK | M MK | M    |
| TUV025     | CT810013                  | MULTI-PURPOSE VALVE ASSEMBLY                 |              |             | M MK | M MK | M MK | M    |
| TUV042     | CT844180                  | DRAIN VALVE ASSEMBLY                         |              | MKV         | M MK | M MK | M MK | M    |
| TUV065     | 03110002                  | SAFETY VALVE (40 PSI)                        | 4            | MKV         | M MK | M MK | M MK | M    |

**IMPORTANT NOTE:** Over the years, Tuttnauer has substituted parts from what has been noted in their manuals. As a precaution, please verify parts before replacing or servicing them.

**FOOTNOTES** 1) TUC041 & TUC063: Both parts fit Models 2340M/MK & 2540M. However, see page 7, Condensation Coils, for specifics. 2) TUG002: Fits Models 2340M S/N 8805 and below. 3) TUG021: Fits Models 2340M/MK S/N 8806 and above. 4) TUJ033/TUJ034, TUH031/TUH032, TUK053/TUK054, TUK077/TUK078 and TUV011/TUV065: See page 7, Safety Valves & Safety Valve Holders. 5) TUH043: For Models 1730M/MK, existing connections should accommodate most units manufactured after January 1993. However, some modifications may be necessary. 6) TUH044: For Models 2340M/MK and 2540 M/MK, existing connections should accommodate most units manufactured after January 1993. However, some modifications may be necessary. 7) TUS035: Fits units prior to 1993.