



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

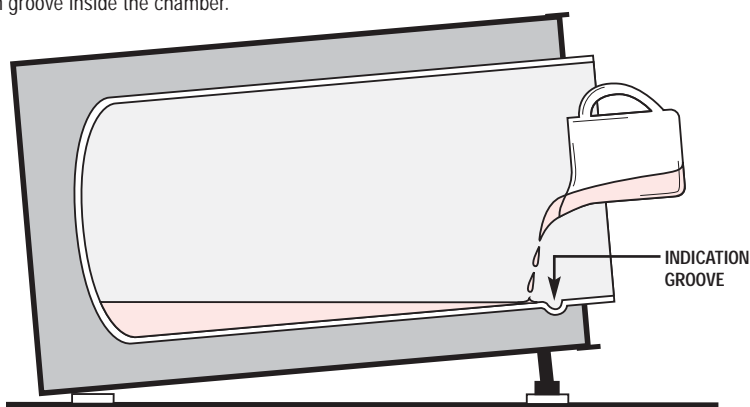
LEVELING THE STERILIZER

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)** Allow to cool to room temperature. **5)** Wear appropriate protective hand and eye gear.

DAILY

Clean the Door Gasket with a soft cloth or sponge using a soft liquid detergent and water. Rinse well and leave no residue.

WEEKLY

- 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. **Caution: Do not use steel wool, a steel brush or chlorinated cleansers on these parts.**
- 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.
- 3. Dry the Chamber, Tray Holder and Trays, and reinstall.
- Place a couple of drops of oil on the two door pins and the door tightening bolts.
- Clean the outside of the unit with a soft cloth or sponge using a non-abrasive cleaner.
- Drain and flush the Water Reservoir while using a baby bottle brush to clear any build up of debris. Refill the reservoir (see **FILLING THE RESERVOIR**, above).
- 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.
- Remove and clean Chamber Filters.
- Check and clean the Air Jet Valve by moving the wire back and forth several times to prevent debris buildup.

MONTHLY

- 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. **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.**
- **After Every 20 Cycles** - Clean Sterilizer with Tutt-Clean™ (RPI Part #'s TUC094 & TUC095) in conjunction with the Sterilizers Cleaning Kit (RPI Part #RPK791) to help remove water deposits, oxides and other sediments.

ANNUALLY

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 har-

SERVICE TIP

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

ness 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

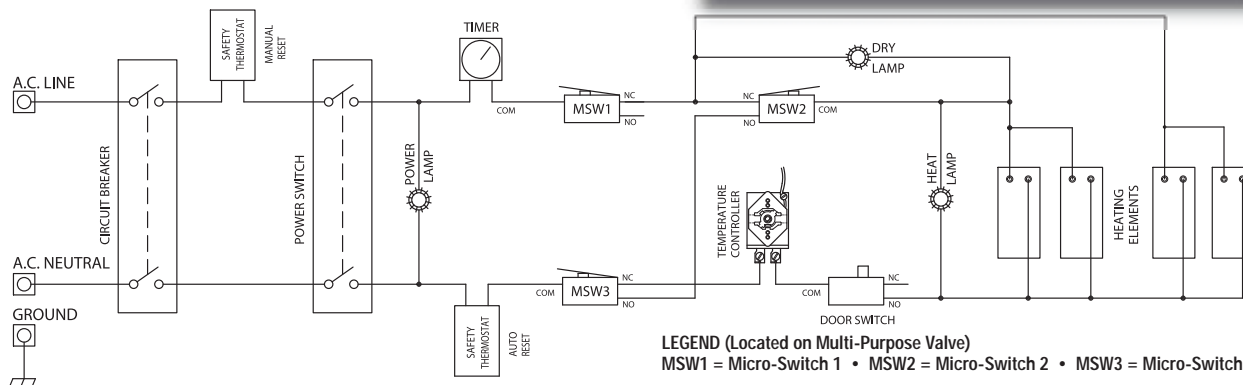
FIGURE 2

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 (Located on Multi-Purpose Valve)

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 & Valueklave 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 & Valueklave 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

- 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.
- 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 & Valueklave 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).
- 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

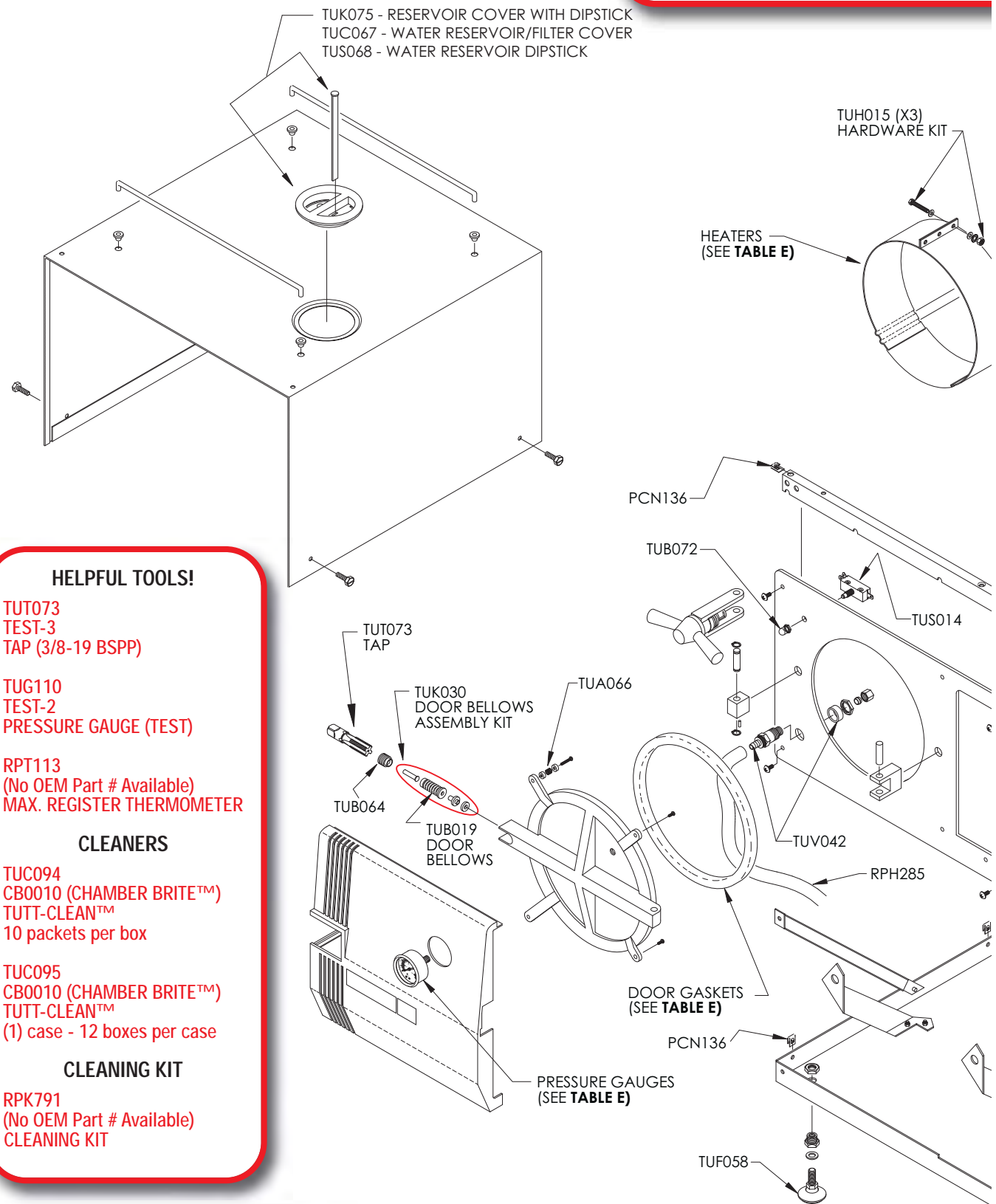
- Refer to **Table A, page 1**, and pour the indicated amount of water into the sterilizer. Turn the power switch ON.
- Close and lock the sterilizer door – be sure to make a tight seal and wait for the heat light to come on.
- Set the sterilizer to the following settings: Multi-Purpose Valve (MPV) set 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.)
- 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

- Disconnect power from sterilizer. Allow to cool. Remove covers.
- 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.
- 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.
- 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.
- If no leaks or obstructions have been found by following the previous steps, and sterilizer is still experiencing a low water condition resulting in overheating 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 Power Switch ON. Replace if necessary.
	Circuit Breaker	Reset breaker. Check for short circuit (see page 2). If no short is found, replace Circuit Breaker .
	Power Lamp	Replace Power Light .
	Open Circuit	Check for loose or disconnected wires. Replace Wire Harness , if necessary.
Heat Lamp OFF in STE cycle	Timer	Check that Timer is turned ON. Timer must be advanced past 10 minutes to activate.
	Heat Lamp	If unit has heat and pressure, check and/or replace Heat Lamp . If unit has <u>no</u> heat, check for open circuit (see page 2).
	Micro-Switch 1 (MSW1) is defective or it is stuck in the down position.	Check MSW1 . Adjust or replace as necessary.
	Control Thermostat	Set Control Thermostat to 212°F or higher. Adjust or replace Control Thermostat as necessary.
Heat lamp is ON; No heat or pressure	Heaters	Measure Heater for proper resistance, see Table C, page 2 . 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 Door Gasket, Door Bellows, Safety Valve, Air Jet Valve, and Condensation Coil . If there are air bubbles in reservoir, check Multi-Purpose Valve . Repair or replace faulty part(s) as necessary.
	Heaters	Measure Heaters for proper resistance, see Table C, page 2 . Check for broken or disconnected wiring.
	Control Thermostat	Set Control Thermostat to 212°F or higher. Adjust or replace Control Thermostat as necessary.
	Excess water in Chamber	Check water level. Check level of unit per <i>Installation Procedure</i> , see Figure 1, page 1 .
	Pressure Gauge	Check and/or replace Pressure Gauge .
Safety Valve opens	Control Thermostat	Reset Control Thermostat to proper value or, if necessary, replace it.
	Safety Valve	If Safety Valve opens below rated cracking pressure, replace it.
Unit overheats, Heat Light stays ON	Water level	Check fill operation and water level, see Figure 1, page 1 .
	Water or steam leak	Check for audible/visual steam leak at Door Gasket, Door Bellows, Safety Valve, Air Jet Valve, and Condensation Coil . If there are air bubbles in reservoir, check Multi-Purpose Valve . 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 Over Temp Safety Switch if necessary.
Heat lamp remains ON when Timer is at 0 or Timer will not advance	Timer	Timer must be advanced past 10 minutes to activate. Check Timer operation and replace if necessary.
Timer Bell does not sound	Timer	Timer must be advanced past 10 minutes to activate. Check Timer 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 Condensation Coil creating a vacuum. Reduce water level to 1" below Safety Valve and open end of Condensation Coil must be above water level. Replace Condensation Coil if necessary.
	Multi-Purpose Valve (if not stuck open)	Remove, disassemble, clean and rebuild, or replace Multi-Purpose Valve (see MULTI-PURPOSE VALVE, page 9).

**HELPFUL TOOLS!**

TUT073
 TEST-3
 TAP (3/8-19 BSPP)

TUG110
 TEST-2
 PRESSURE GAUGE (TEST)

RPT113
 (No OEM Part # Available)
 MAX. REGISTER THERMOMETER

CLEANERS

TUC094
 CB0010 (CHAMBER BRITE™)
 TUTT-CLEAN™
 10 packets per box

TUC095
 CB0010 (CHAMBER BRITE™)
 TUTT-CLEAN™
 (1) case - 12 boxes per case

CLEANING KIT

RPK791
 (No OEM Part # Available)
 CLEANING KIT

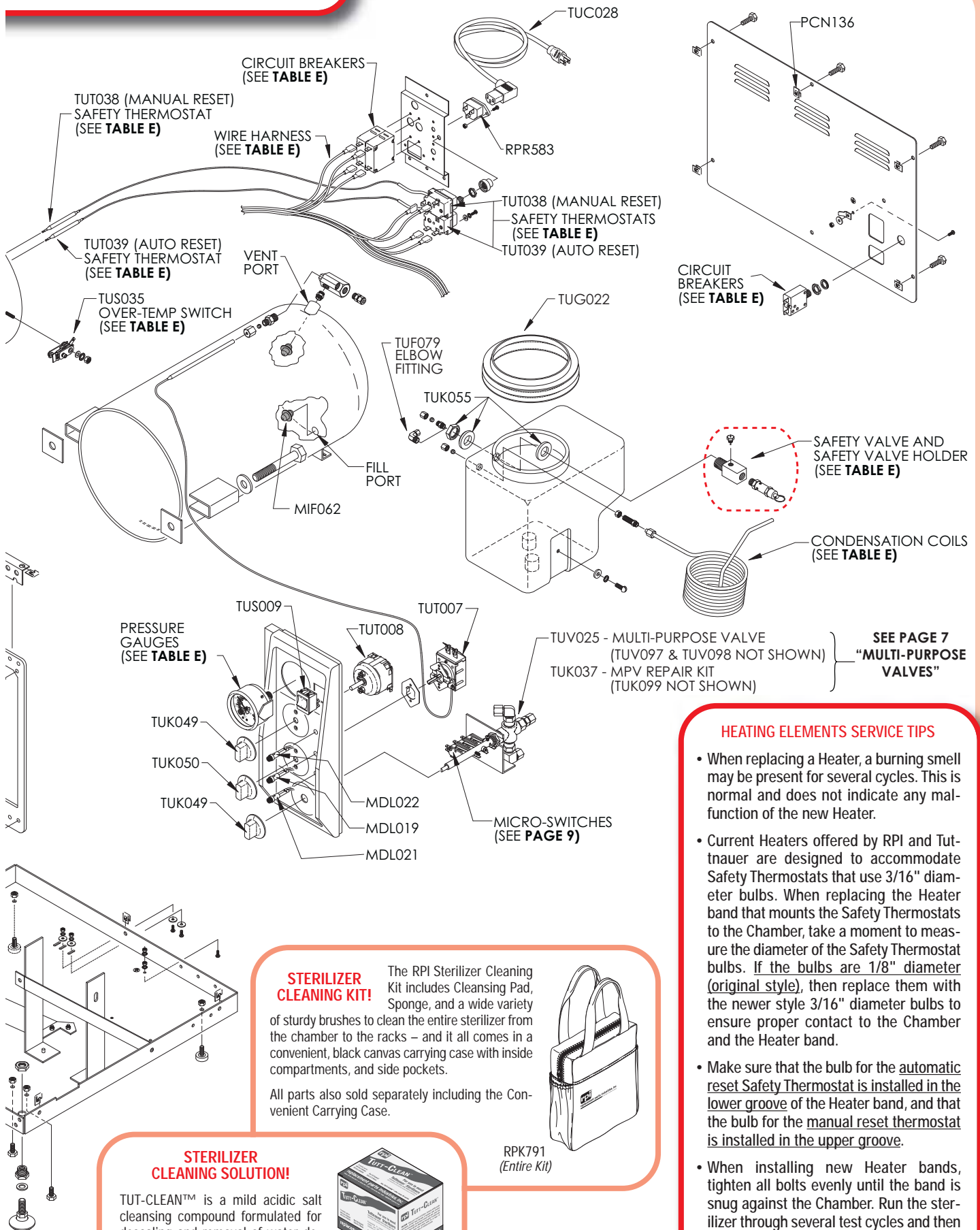
**FREE TECHNICAL ASSISTANCE
FROM RPI**

CALL (800) 221-9723

FAX (818) 882-7028

E-MAIL techsupport@rpiarts.com

WEBSITE www.rpiarts.com



HEATING ELEMENTS SERVICE TIPS

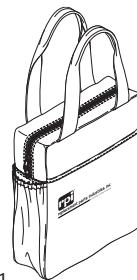
- When replacing a Heater, a burning smell may be present for several cycles. This is normal and does not indicate any malfunction of the new Heater.
- Current Heaters offered by RPI and Tuttnauer are designed to accommodate Safety Thermostats that use 3/16" diameter bulbs. When replacing the Heater 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.

STERILIZER CLEANING KIT!

The RPI Sterilizer Cleaning Kit includes Cleansing Pad, Sponge, and a wide variety of sturdy brushes to clean the entire sterilizer from the chamber to the racks – and it all comes in a convenient, black canvas carrying case with inside compartments, and side pockets.

All parts also sold separately including the Convenient Carrying Case.

RPK791
(Entire Kit)



STERILIZER CLEANING SOLUTION!

TUT-CLEAN™ is a mild acidic salt cleansing compound formulated for descaling and removal of water deposits, oxides, and other sediments from sterilizers. Also available by the case (RPI Part #TUC095).



TUC094
(Package of 10 packets)

TABLE E - QUICK REFERENCE
Various Part Options Available for Specific Models.

CIRCUIT BREAKERS

RPI Part #	Style	Options
TUB023	Lever	15 AMPS
TUB024	Lever	10 AMPS
TUB048	Push Button	7 AMPS
TUB047	Push Button	15 AMPS

GASKETS

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

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

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

CONDENSATION COILS

RPI Part #	Fits Models
TUC040	1730M/MK
TUC041	Fits earlier models where coil joins reservoir at the left <u>rear</u> 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.

PRESSURE GAUGES

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

MULTI-PURPOSE VALVES

NOTE - Valueklaves (1730 MKV) manufactured with the Multi-Purpose Valves on the right side of the machine utilized either the Long or Short shaft versions.

Multi-Purpose Valve	Fits Models	Description	MPV Repair Kit
TUV025	1730M/MK, 2340M/MK, 2540M/MK & 3870M	Long Shaft	TUK037
TUV097	Valueklave 1730 MKV	Long Shaft	TUK037
TUV098	Valueklave 1730 MKV	Short Shaft	TUK099

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)

SAFETY VALVES & SAFETY VALVE HOLDERS

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 chart below for listing of parts and corresponding Models.)

Description	M		MK		MKV
	1730/2340/2540/3870		1730/2340/2540		Valueklave (1730)
Air Jet Valve	37 PSI	40 PSI	37 PSI	40 PSI	40 PSI
	TUJ034 <i>Black Top</i>	TUJ034 <i>Black Top</i>	TUJ033 <i>Red Top</i>	TUJ033 <i>Red Top</i>	TUJ033 <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

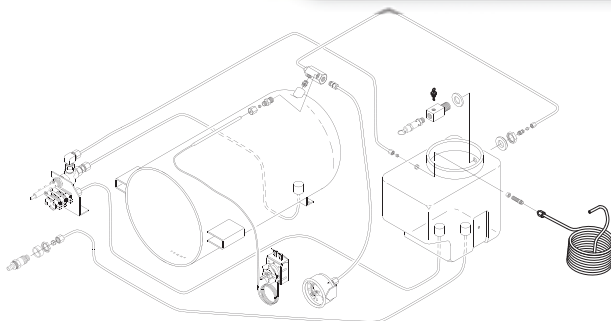
STERILIZER PM KITS

RPI Part #	Fits Models
TUK121	1730M
TUK122	1730MK & Valueklave 1730 MKV
TUK123	2340M (Serial #8805 and below)
TUK124	2340M (Serial #8806 and above)
TUK126	2340MK
TUK128	2540M
TUK130	2540MK
TUK131	3870M

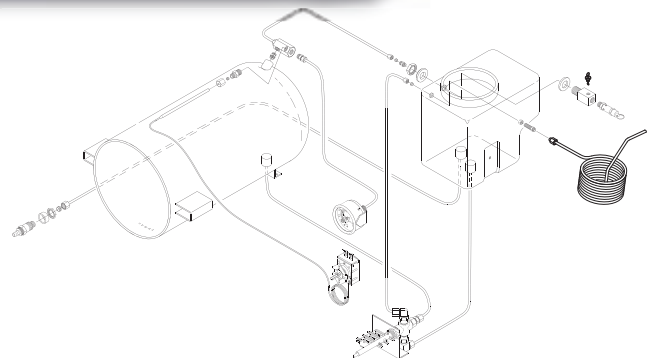
WIRE HARNESSES

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

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:

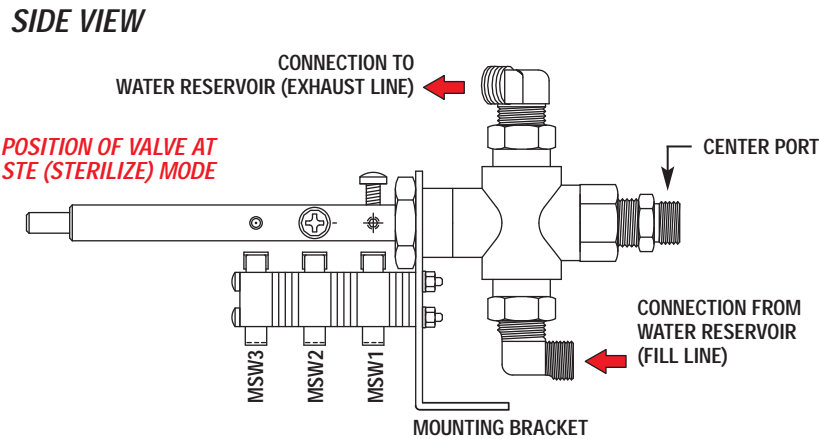
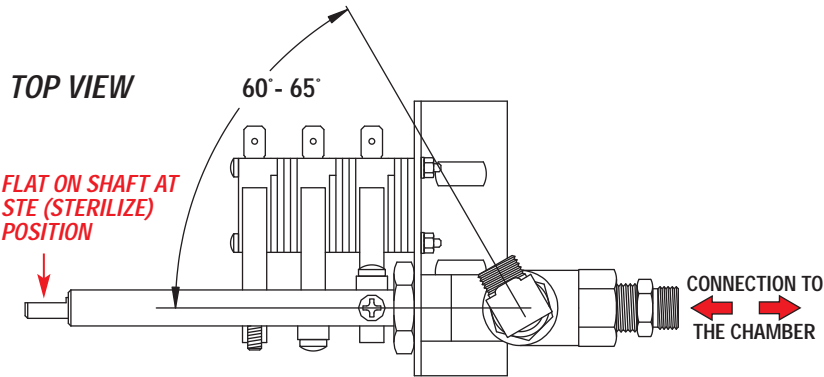
Turn the power **OFF**. Wear protective hand and eye gear. Use a tool such as a screwdriver or wrench (*do not use your fingers*) to *pull* the Safety Valve Pull Ring, and vent the Chamber to ZERO pressure. **Allow the unit to cool down.**

SYMPTOM	CAUSE	SOLUTION
MPV will not rotate.	MPV is jammed.	Remove, disassemble, clean and rebuild, or replace MPV. See Important Note! , above.
MPV valve rotates in both directions.	Broken Anti-rotational Spring Clip.	Remove, disassemble, clean and rebuild, or replace MPV. See Important Note! , 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 Important Note! , 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 Heater for proper resistance, see Table C, page 2 . 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 past 10 minutes . If timer still does not activate, then replace Timer.
	Micro-Switch 1 (MSW1) is defective or it is stuck in the down position.	Set MPV to STE position, if Heat Light is OFF, adjust or replace MSW1 . Refer to MULTI-PURPOSE VALVE & MICRO-SWITCHES, page 9 .
	Micro-Switch 2 (MSW2) is defective or it is stuck in the down position.	Set MPV to STE position, if Heat Light is OFF, adjust or replace MSW2 . Refer to MULTI-PURPOSE VALVE & MICRO-SWITCHES, page 9 .
In EXH-DRY position, Dry and Heat Lights OFF (Door open)	Micro-Switch 3 (MSW3) is defective or it is stuck in the up position.	Adjust or replace MSW3 . Refer to MULTI-PURPOSE VALVE & MICRO-SWITCHES, page 9 .
In EXH-DRY position, Circuit Breaker trips when Timer is set.	Micro-Switch 2 (MSW2) is defective or it is stuck in the up position.	Adjust or replace MSW2 . Refer to MULTI-PURPOSE VALVE & MICRO-SWITCHES, page 9 .
	Short circuit in Wiring Harness.	Check and replace Wiring Harness 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 up position.	Adjust or replace MSW3 . Refer to MULTI-PURPOSE VALVE & MICRO-SWITCHES, page 9 .
Door will not open after Chamber is exhausted and MPV is in the EXH-DRY position	Door Bellows could be jammed.	1) See Important Note! , above. Then turn door closing device slightly clockwise to tighten, then turn counter clockwise to open. 2) See Important Note! , 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 Door Bellows Assembly .
	Vacuum in Chamber (pressure below zero).	See Important Note! , above. If this does not correct the situation, then check if MPV has blockage, see page 3, REMOVING OBSTRUCTIONS .

MULTI-PURPOSE VALVE (MPV)

Illustrations shown below refer to right side MPV mount only

NOTE: The illustrations below show the Multi-Purpose Valve (RPI Part #TUV025). The Multi-Purpose Valves (RPI Part #'s TUV097 & TUV098) have slightly different connection fittings and orientations



NEW STYLE MICRO-SWITCH OPERATION

CLOSED = SWITCH ACTIVATED • OPEN = SWITCH NOT ACTIVATED

VALVE POSITION	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

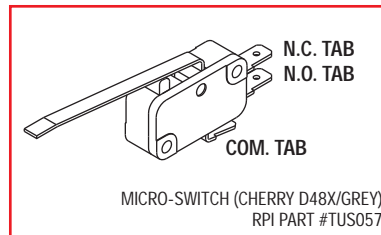
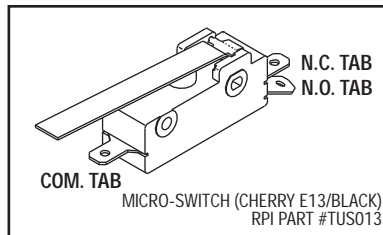
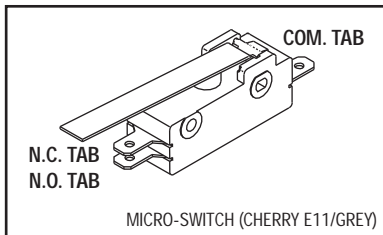
CYCLE TYPE: Wrapped
COLD START: 20 minutes
HOT START: 15 minutes

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

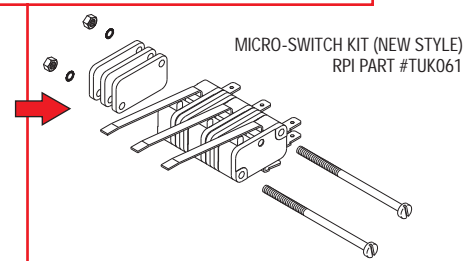
• The sterilization times noted above are based on the information sticker located on the unit's outer covering. If the voltage is significantly less than the voltage noted, then additional time must be added to each cycle to ensure proper functionality.

• 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.



LIST OF RPI PARTS AVAILABLE TO FIT TUTTNAUER® MANUAL UNITS AS OF SEPTEMBER, 2012

RPI PART #	OEM PART #	DESCRIPTION	SEE NOTE	VALUE-KLAVE	1730	2340	2540	3870	RPI PART #	OEM PART #	DESCRIPTION	SEE NOTE	VALUE-KLAVE	1730	2340	2540	3870
MDL019	01960007	SIGNAL LIGHT - RED (125VAC)			M	M	M		TUG003	02610023	DOOR GASKET					M MK	
MDL021	01910257	SIGNAL LIGHT - AMBER (125VAC)		MKV	M	M	M		TUG012	02300011	PRESSURE GAUGE W/ INDICATOR (2-1/2")			M MK	M MK	M MK	M
MDL022	01910258	SIGNAL LIGHT - GREEN (125VAC)		MKV	M	M	M		TUG020	02300012	PRESSURE GAUGE (1-1/2")		MKV				
MIF062	(No OEM Part # Available)	FILL/VENT MESH CHAMBER FILTER		MKV	M MK	M MK	M MK	M	TUG021	02610118	DOOR GASKET	3			M MK		
PCS036	(No OEM Part # Available)	AIR RELEASE VALVE SEAT		MKV	M MK	M MK	M MK	M	TUG022	02610029	WATER RESERVOIR GASKET		MKV	M MK	M MK	M MK	M
RPA032	(No OEM Part # Available)	THREADLOCKER 242		MKV	M MK	M MK	M MK	M	TUG074	02610019	DOOR GASKET						M
RPA369	(No OEM Part # Available)	THREADLOCKER 545		MKV	M MK	M MK	M MK	M	TUG110	TEST-2	PRESSURE GAUGE (TEST)		MKV	M MK	M MK	M MK	M
RPA459	(No OEM Part # Available)	PIPE SEALANT 567		MKV	M MK	M MK	M MK	M	TUH004	01720011	HEATER ELEMENT (120VAC, 450W)		MKV	M MK			
RPB792	(No OEM Part # Available)	LARGE DIA. BRUSH (1-3/4")		MKV	M MK	M MK	M MK	M	TUH005	01720002	HEATER ELEMENT (120VAC, 350W)				M		
RPB793	(No OEM Part # Available)	SMALL DIA. BRUSH (3/8")		MKV	M MK	M MK	M MK	M	TUH006	01720003	HEATER ELEMENT (120VAC, 350W)					M	
RPB794	(No OEM Part # Available)	SCRUB BRUSH		MKV	M MK	M MK	M MK	M	TUH015	(No OEM Part # Available)	ATTACHING HARDWARE (Fits Heaters)		MKV	M MK	M MK	M MK	M
RPB795	(No OEM Part # Available)	HANDLE BRUSH		MKV	M MK	M MK	M MK	M	TUH016	01720012	HEATER ELEMENT (230VAC, 450W)			MK			
RPB796	(No OEM Part # Available)	FLEXIBLE TUBE BRUSH (7/8")		MKV	M MK	M MK	M MK	M	TUH017	01720013	HEATER ELEMENT (230VAC, 550W)				MK		
RPC582	02819996	POWER CORD (220VAC)			MK	MK	MK		TUH018	01720014	HEATER ELEMENT (230VAC, 550W)					MK	
RPC799	(No OEM Part # Available)	CARRYING CASE		MKV	M MK	M MK	M MK	M	TUH027	01720001	HEATER ELEMENT (120VAC, 350W)			M			
RPF216	(No OEM Part # Available)	COMPRESSION SLEEVE		MKV	M MK	M MK	M MK	M	TUH031	CT841010	SAFETY VALVE HOLDER	4	MKV	MK	MK	MK	
RPF217	(No OEM Part # Available)	COMPRESSION SLEEVE		MKV	M MK	M MK	M MK	M	TUH032	CT841020	SAFETY VALVE HOLDER	4		M	M	M	M
RPF221	(No OEM Part # Available)	COMPRESSION NUT		MKV	M MK	M MK	M MK	M	TUH043	CU900012	WIRE HARNESS	5		M MK			
RPH105	(No OEM Part # Available)	#8 SPLIT LOCK WASHER			M MK	M MK	M MK	M	TUH044	CT900012	WIRE HARNESS	6			M MK	M MK	
RPH108	(No OEM Part # Available)	#8 FLAT WASHER			M MK	M MK	M MK	M	TUJ033	CB842010	AIR JET VALVE (Red Top)	4	MKV	MK	MK	MK	
RPH118	(No OEM Part # Available)	METRIC SCREW (M4 X 8)			M MK	M MK	M MK	M	TUJ034	CT842010	AIR JET VALVE (Black Top)	4		M	M	M	M
RPH130	(No OEM Part # Available)	METRIC SCREW (M4 X 8)		MKV	M MK	M MK	M MK	M	TUK030	CT241111	DOOR BELLOWS ASSEMBLY KIT		MKV	M MK	M MK	M MK	M
RPH186	(No OEM Part # Available)	1/4" EXTERNAL TOOTH WASHER		MKV	M MK	M MK	M MK	M	TUK037	(No OEM Part # Available)	MULTI-PURPOSE VALVE REPAIR KIT		MKV	M MK	M MK	M MK	M
RPH285	02620016A	DRAIN HOSE		MKV	M MK	M MK	M MK	M	TUK049	02450002	TIMER & MULTI-PURPOSE VALVE KNOB		MKV	M MK	M MK	M MK	M
RPK791	(No OEM Part # Available)	CLEANING KIT		MKV	M MK	M MK	M MK	M	TUK050	02450003	THERMOSTAT KNOB		MKV	M MK	M MK	M MK	
RPL090	(No OEM Part # Available)	HIGH TEMP LUBRICANT		MKV	M MK	M MK	M MK	M	TUK053	(No OEM Part # Available)	SAFETY VALVE HOLDER KIT (37 PSI)	4		MK	MK	MK	
RPO360	(No OEM Part # Available)	O-RING (Multi-Purpose Valve)		MKV	M MK	M MK	M MK	M	TUK054	(No OEM Part # Available)	SAFETY VALVE HOLDER KIT (37 PSI)	4		M	M	M	M
RPO386	02610030/Inner	O-RING (Drain Valve)		MKV	M MK	M MK	M MK	M	TUK055	(No OEM Part # Available)	MOUNTING HARDWARE (Fits Safety Valve Holder)		MKV	M MK	M MK	M MK	M
RPO387	02610027/Outer	O-RING (Drain Valve)		MKV	M MK	M MK	M MK	M	TUK061	01910197/Switch Only	MICRO-SWITCH KIT		MKV	M MK	M MK	M MK	M
RPO439	(No OEM Part # Available)	O-RING (Multi-Purpose Valve)		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
RPO448	(No OEM Part # Available)	O-RING (Multi-Purpose Valve)		MKV	M MK	M MK	M MK	M	TUK077	(No OEM Part # Available)	SAFETY VALVE HOLDER KIT (40 PSI)	4	MKV	MK	MK	MK	
RPO488	(No OEM Part # Available)	O-RING (Multi-Purpose Valve)		MKV	M MK	M MK	M MK	M	TUK078	(No OEM Part # Available)	SAFETY VALVE HOLDER KIT (40 PSI)	4		M	M	M	M
RPP798	(No OEM Part # Available)	CLEANSING PAD		MKV	M MK	M MK	M MK	M	TUK099	((No OEM Part # Available)	REPAIR KIT (MPV)		MKV				
RPR583	02819993	AC INLET RECEPTACLE		MKV	M	M MK	M MK	M	TUK121	02610020 (Gasket Only)	STERILIZER PM KIT			M			
RPS797	(No OEM Part # Available)	SPONGE (4-1/4" x 6")		MKV	M MK	M MK	M MK	M	TUK122	02610020 (Gasket Only)	STERILIZER PM KIT		MKV	MK			
RPT018	(No OEM Part # Available)	WIRE NUT			M MK	M MK	M MK		TUK123	02610005 (Gasket Only)	STERILIZER PM KIT	8			M		
RPT113	(No OEM Part # Available)	MAX REGISTER THERMOMETER		MKV	M MK	M MK	M MK	M	TUK124	02610118 (Gasket Only)	STERILIZER PM KIT	9			M		
RPT579	(No OEM Part # Available)	1/4" TEFLON THREAD SEALING TAPE		MKV	M MK	M MK	M MK	M	TUK126	02610118 (Gasket Only)	STERILIZER PM KIT				MK		
RPT580	(No OEM Part # Available)	1/2" TEFLON THREAD SEALING TAPE		MKV	M MK	M MK	M MK	M	TUK128	02610023 (Gasket Only)	STERILIZER PM KIT					M	
TUA060	(No OEM Part # Available)	THREADED ADAPTER (Fits Safety Valve Holder)		MKV	M MK	M MK	M MK	M	TUK130	02610023 (Gasket Only)	STERILIZER PM KIT					MK	
TUA066	CT312036	DOOR SWITCH ACTIVATOR		MKV	M MK	M MK	M MK	M	TUK131	02610019 (Gasket Only)	STERILIZER PM KIT						M
TUB019	(No OEM Part # Available)	DOOR BELLOWS		MKV	M MK	M MK	M MK	M	TUS009	01910172	POWER SWITCH		MKV	M MK	M MK	M MK	M
TUB023	01910098	CIRCUIT BREAKER (15A)		MKV	M	M	M		TUS013	01910191	MICRO-SWITCH (CHERRY E13/BLACK)			M MK	M MK	M MK	M
TUB024	01910097	CIRCUIT BREAKER (10A)			MK				TUS014	01910190	DOOR SWITCH		MKV	M MK	M MK	M MK	M
TUB047	01910100	CIRCUIT BREAKER (15A)			M MK	M MK	M MK	M	TUS035	01620301	OVER TEMPERATURE SAFETY SWITCH	7		MK	MK	MK	
TUB048	01910099	CIRCUIT BREAKER (7A)			MK				TUS057	01910197	MICRO-SWITCH (CHERRY D48X/GREY)		MKV	M MK	M MK	M MK	M
TUB064	CT245010	DOOR BELLOW HOUSING BOLT		MKV	M MK	M MK	M MK	M	TUS068	2550043	WATER RESERVOIR DIPSTICK		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	TUT007	01620101	CONTROL THERMOSTAT		MKV	M MK	M MK	M MK	M
TUC028	02819995	POWER CORD (125VAC)		MKV	M	M	M	M	TUT008	01910011 & 01910005	TIMER			M MK	M MK	M MK	M
TUC040	CU836101	CONDENSATION COIL			M MK				TUT038	01620004	SAFETY THERMOSTAT (MANUAL RESET)			M MK	M MK	M MK	M
TUC041	CT836101	CONDENSATION COIL	1	MKV		M MK	M MK		TUT039	01620103	SAFETY THERMOSTAT (AUTOMATIC RESET)			M MK	M MK	M MK	M
TUC063	CT836101	CONDENSATION COIL	1			M MK	M MK		TUT073	TEST-3	TAP (3/8-19 BSPP)		MKV	M MK	M MK	M MK	M
TUC067	02500019	WATER RESERVOIR/FILTER COVER		MKV	M MK	M MK	M MK	M	TUV011	03110003	SAFETY VALVE (37 PSI)	4		M MK	M MK	M MK	M
TUC094	CB0010 (Chamber Brite™)	TUTT-CLEAN™		MKV	M MK	M MK	M MK	M	TUV025	CT810013	MULTI-PURPOSE VALVE ASSEMBLY			M MK	M MK	M MK	M
TUC095	CB0010 (Chamber Brite™)	TUTT-CLEAN™ (CASE)		MKV	M MK	M MK	M MK	M	TUV042	CT844180	DRAIN VALVE ASSEMBLY		MKV	M MK	M MK	M MK	M
TUF058	04010001 & 04010002	LEVELING FOOT		MKV	M MK	M MK	M MK	M	TUV065	03110002	SAFETY VALVE (40 PSI)	4	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	TUV097	CMT173-0031	MULTI-PURPOSE VALVE (Long Shaft)		MKV				
TUG001	02610020	DOOR GASKET		MKV	M MK				TUV098	CMT173-0031	MULTI-PURPOSE VALVE (Short Shaft)		MKV				
TUG002	02610005	DOOR GASKET	2			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) TUG033/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.

© RPI, 2012