Tuttnauer

Your Sterilization & Infection Control Partners

TECHNICIAN MANUAL

Table -Top Autoclaves
models 1730, 2340, 2540, 3140, 3850, 3870 M & MK
1730MK Valueklave

Cat. No. MAN205-0309001EN Rev. K

Tuttnauer Europe b.v., Hoeksteen 11, 4815 PR, Breda, P.O. Box 7191, 4800 GD Breda, Netherlands. ✆+31/76-5423510, Fax: +31/76-5423540

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1 INTRODUCTION

This manual, together with the operator's manual, forms the complete edition of the Operation and Maintenance instructions. This manual is intended for the use of the technician. It is forbidden for unqualified and unauthorized personnel to service the autoclave in accordance with the instructions in this manual. Any unauthorized service may result in the invalidation of the manufacturer's guarantee.

The qualified technician shall be an authorized electrician with the right qualifications in electronics and shall be familiar with the local technical/electrical regulations.

2 PERIODICAL TESTS

PERIOD	TEST
1 months	Test the safety valve by operating it.
6 months	Remove the autoclave's cover, tighten the heaters' screws and electrical connections and valves.
Year	Check the continuity of the grounding connections.
	Perform validation of the autoclave.
	Check the precise operation of the earth leakage relay.
	Check that the autoclave is leveled.
	Check the safety elements; safety valve, door locking bellows and door locking mechanisms.
	Run the autoclave and verify that it operates as specified.
	Check the water reservoir, piping, plastic parts and electric wires.
	Check and tighten the piping joints to avoid leakage.
	Check and tighten all screw connections, heaters and valves and instrumentation.
	Calibrate the temperature and pressure once a year or in reference to local rules or regulations (refer to the section on Calibration).
5 years	Observe the closing device for excessive wear
Safety tests (pressure vessel, efficiency, electrical) shall be performed in accordance with local rules or regulations, by an authorized inspector.	

Only an authorized technician shall perform the 6-months and yearly tests!

3 SYMBOL DESCRIPTION

Caution! Consult accompanying documents

Caution! Hot Surface.

Caution! Hot steam.

Ground

4 SAFETY INSTRUCTIONS

The autoclave has unique characteristics. Please read and understand the operation instructions before first operation of the autoclave. The following issues may require instructions guidance provided by the manufacturer: how to operate the autoclave, the door safety mechanism, the dangers involved in circumventing safety means, how to ensure that the door is closed, and how to select a correct sterilization program.

Autoclave maintenance is crucial for the correct and efficient function of the device. We enclose a log booklet that includes maintenance recommendations, with every device.

1. Make sure that you know where the main power switch is.
2. Never use the autoclave to sterilize corrosive products, such as: acids, bases and phenols, volatile compounds or solutions such ethanol, methanol or chloroform nor radioactive substances.
3. All autoclave users must receive training in proper usage from an experienced employee. Every new employee must undergo a training period under an experienced employee.
4. A written procedure must be established for autoclave operation, including: daily safety tests, seal inspection and door hinge inspection, smooth action of the closing mechanism, chamber cleaning, prevention of clogging and preservation from corrosion, what is permitted and what is prohibited for sterilization and choosing a sterilization program.
5. Before use, check inside the autoclave chamber to ensure that no items have been left from the previous cycle.
6. Load trays in such a way as to allow steam to move freely among all items.
7. Do not attempt to sterilize liquids since this autoclave **is not** intended to sterilize liquids.
8. When sterilizing plastic materials, make sure that the item can withstand sterilization temperature. Plastic that melts in the chamber is liable to cause a great deal of damage.
9. On closing the device door, make sure it is properly locked before activating.
10. Verify once again that you have chosen the appropriate sterilization program.
11. Before withdrawing trays, wear heat resistant gloves.
12. Before opening the door, verify that there is no pressure in the chamber (chamber pressure gauge is located on the autoclave's front panel).
13. Open the door slowly to allow steam to escape and wait 5 minutes before you remove the load.
14. Once a month, ensure that the safety valves are functioning, and once annually a certified tester must conduct pressure chamber safety tests.
15. Once annually, or more frequently, effective tests must be performed, i.e., calibration and validation.
16. Examine the condition of assemblies on a regular basis. Make sure there are no leaks, breaks, blockages, whistles or strange noises.
17. It is required to conduct maintenance operations as instructed.
18. Immediately notify the person in charge of any deviation or risk for the proper function of the device.

5 WATER QUALITY

5.1 Water for Generating Steam

The distilled or mineral – free water supplied to the sterlizer shall be according to the table below:

Physical Characteristics and Maximum acceptable contaminants levels in steam for sterlizers (According to EN 13060:2004).

Element	Condensate – allowable content
Silicium oxide. SiO_2	≤0.1 mg/kg
Iron	≤0.1 mg/kg
Cadmium	≤0.005 mg/kg
Lead	≤ 0.05 mg/kg
Rest of metals except iron, cadmium, lead	≤0.1 mg/kg
Chloride (Cl)	≤0.1 mg/kg
Phosphate (P_2O_5)	≤0.1 mg/kg
Conductivity (at 20°C)	≤3 μs/cm
pH value (degree of acidity)	5 to 7
Appearance	Colourless clean without sediment
Hardness (Σ Ions of alkaline earth)	≤0.02 mmol/l

Compliance with the above data should be tested in accordance with acknowledged analytical methods, by an authorized laboratory.

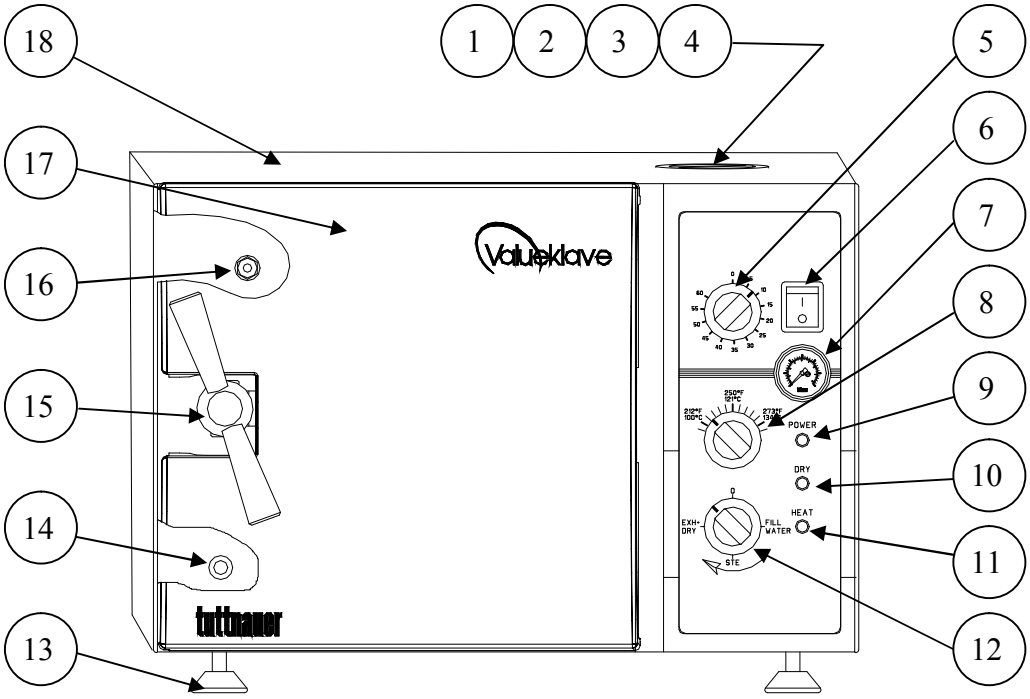
Attention:

We recommend testing the water quality once a month. The use of water that does not comply with the table above may have severe impact on the working life of the sterilizer and can invalidate the manufacturer's guarantee.

5.2 Reverse Osmosis

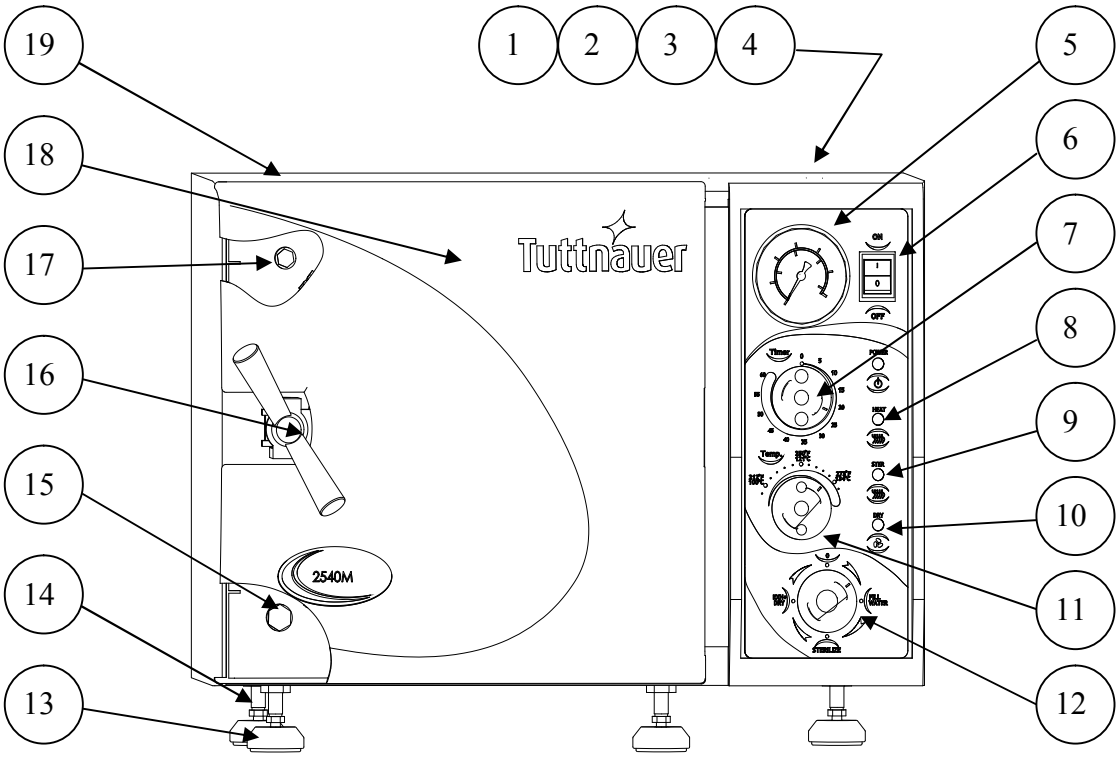
A Reverse Osmosis system may be used to improve the quality of the water used to generate steam in the autoclave chamber. The use of mineral free will contribute to better performance and longer life of the autoclave.

FRONT VIEW MODEL 1730 M, MK-Valueklave



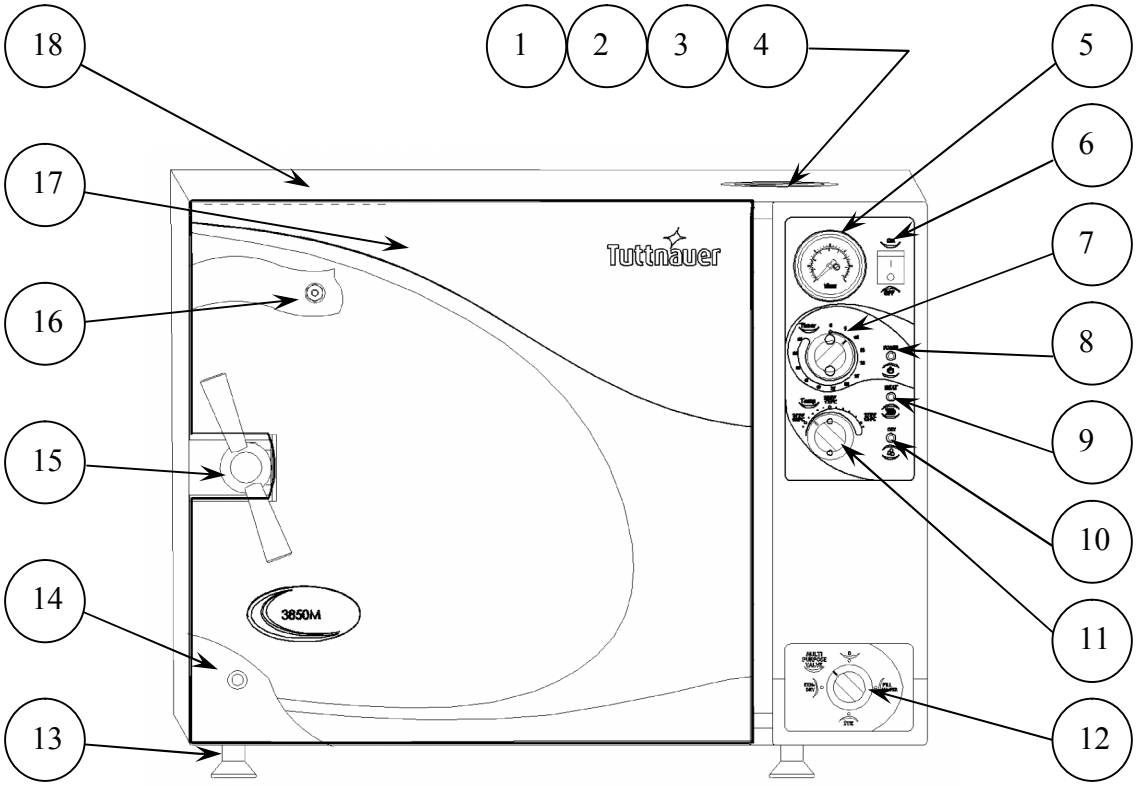
No.	description	No.	description
1.	Water reservoir cover	10.	Dry indicator light
2.	Water reservoir	11.	Heat indicator light
3.	Safety valve	12.	Multipurpose valve
4.	Air trap jet	13.	Front legs
5.	Timer	14.	Reservoir water drain valve
6.	Main power switch	15.	Door Closing Device
7.	Pressure gauge	16.	Door Micro-switch
8.	Thermostat (B10) knob	17.	Door cover
9.	Power indicator light	18.	Autoclave cover

FRONT VIEW MODEL 2340/2540 M, MK



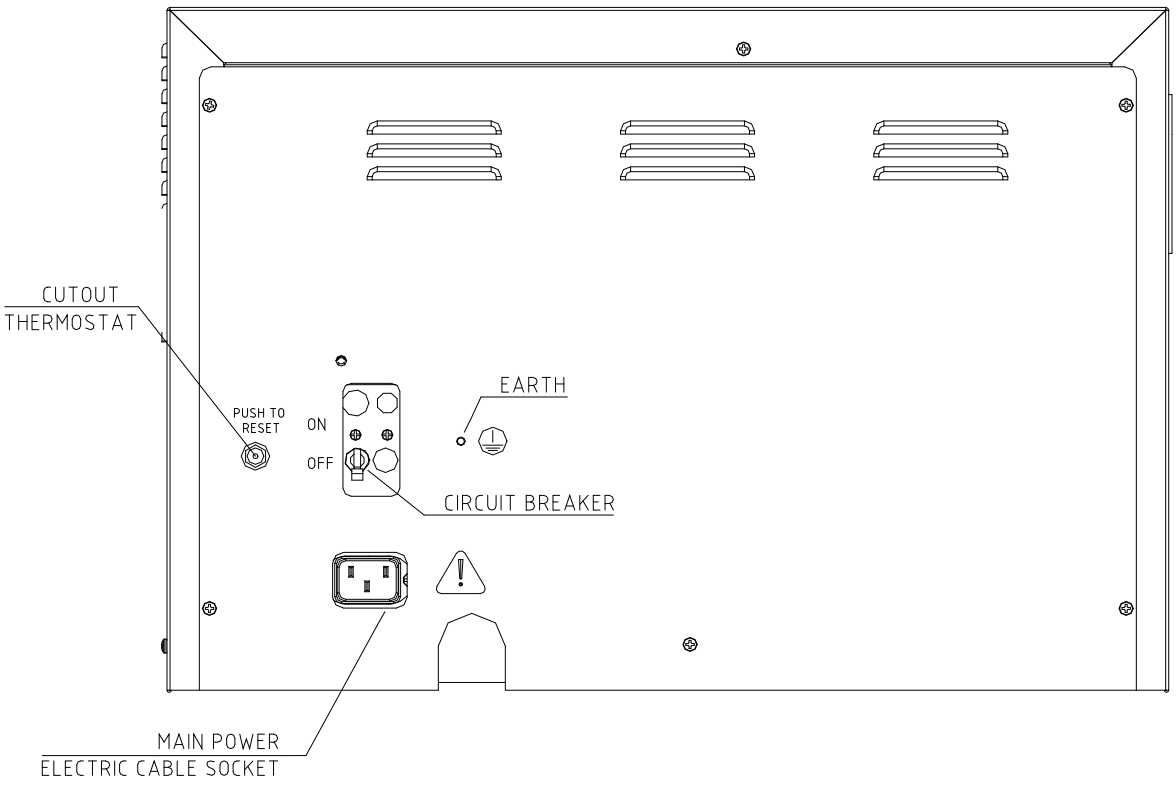
No.	description	No.	description
1.	Water reservoir cover	10.	Heat indicator light
2.	Water reservoir	11.	Thermostat (B10) knob
3.	Safety valve	12.	Multipurpose valve
4.	Air trap jet	13.	Front legs
5.	Pressure gauge	14.	Rear legs
6.	Main power switch	16.	Door Closing Device
7.	Timer	18.	Door cover
8.	Power indicator light	19.	Autoclave cover
9.	Dry indicator light		

FRONT VIEW MODEL 3850/3870 M, MK



No.	description	No.	description
1.	Water reservoir cover	10.	Heat indicator light
2.	Water reservoir	11.	Thermostat (B10) knob
3.	Safety valve	12.	Multipurpose valve
4.	Air trap jet	13.	Front legs
5.	Pressure gauge	14.	Reservoir water drain valve
6.	Main power switch	15.	Door Closing Device
7.	Timer	16.	Door Micro-switch
8.	Power indicator light	17.	Door cover
9.	Dry indicator light	18.	Autoclave cover

REAR VIEW


CUTOUT
THERMOSTAT
PUSH TO
RESET
ON
OFF
EARTH
CIRCUIT BREAKER
MAIN POWER
ELECTRIC CABLE SOCKET

6 MAINTAINING AND REPLACING PARTS

6.1 Safety Tests after Repair

ATTENTION!

After every repair or dismantling the enclosure, the autoclave should pass two safety electrical test by the Service Engineer. The following shall be performed:

Warning!

When re-installing the enclosure, connect the earthing to the cover. On installing the rear cover, connect the earthing before accomplishing the installation of the rear cover.

6.1.1 Enclosure Leakage Current Test.

Every autoclave should pass this test as follows:

1. Connect the electrical cord to the autoclave.
2. Turn on the main switch and the circuit breaker.
3. Short-circuit the L and N pins on the cord's plug.
4. Connect the Short-circuit pins to the L pole on the Megger.
5. Connect the earth pins to the earth pole on the Megger.
6. Impose an electrical potential of 500-1000V on the tested autoclave. The insulation resistance should be at least 2 MΩ.

   The test is successful if there was no leakage.

6.1.2 Protective Earth Impedance Test

1. Connect the grounding pin of the power cord plug to one pole of an Ohmmeter.
2. Connect any other metallic part (preferable – the metallic part of the locking screw) to the second pole of the Ohmmeter.
3. The resistance should not exceed 0.3 Ω.

After performing these tests, the Service Engineer should complete and sign the Work Order.

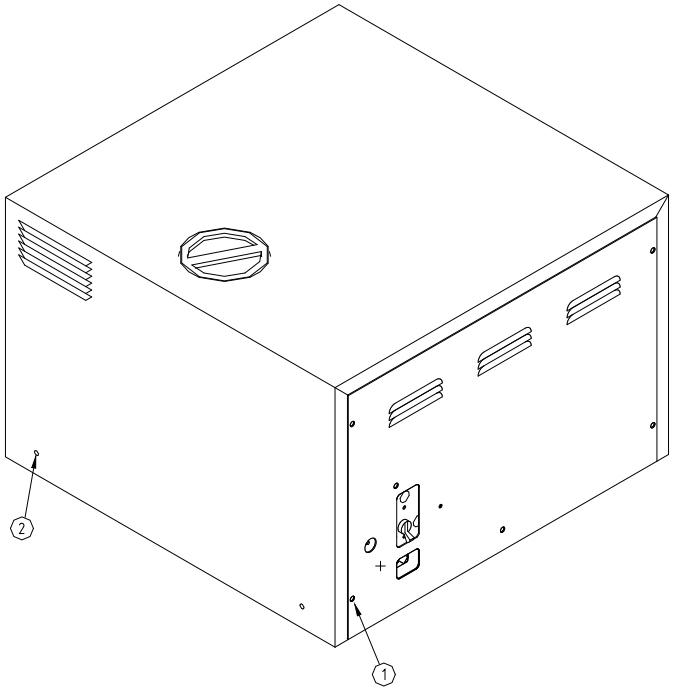
6.2 Dismantling the Outer Cover of the Autoclave.

Caution:
Allow the instrument to cool before removing the outer covers.

Warning:
Before starting disconnect the instrument from the power source and make sure there is no pressure in the autoclave.

Then proceed as follows:

1. Remove the screws holding the rear cover (1).
2. Remove the screws holding the cover to the base (2).
3. Pull the cover upwards.



6.3 Cleaning and Replacing Air Trap Jet

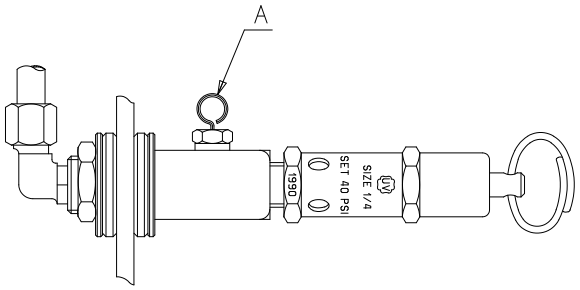
(Located in the water reservoir)

The elimination of air pockets from the sterilization chamber during heating and sterilization phases is achieved by means of the air trap jet. This device consists of a small orifice that is obtrusive and opened by a small wire moving forth and back.
The air pockets and small steam quantities are pushed up by the steam pressure and evacuated through this orifice.

Caution:

Before starting, ensure that the electric cord is disconnected and that there is no pressure in the autoclave.

1. Remove the water reservoir cover.
2. Clean the hole of the jet by manipulating the air trap wire back and forth (A).
3. In case it is necessary to replace the air trap jet, allow the instrument to cool and the pressure to drop to 0 before removing the jet.



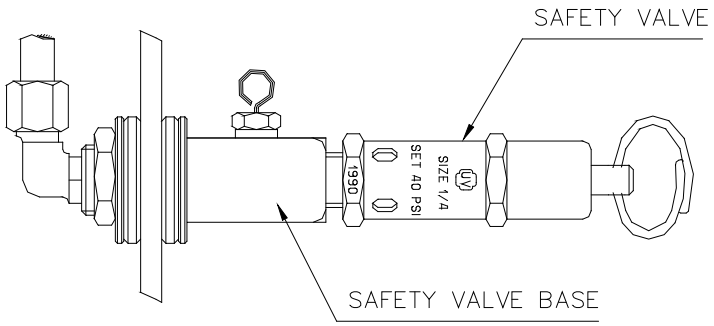
It is important to clean the hole of the air trap, as described at point 2 before starting operation of the autoclave, for the first time.

6.4 Replacing the Safety Valve

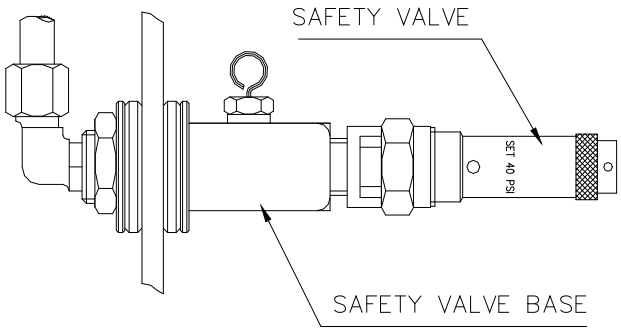
Caution
Before starting, be sure that the electric cord is disconnected and that there is no pressure in the autoclave.
Note:
These instructions are valid for both, CE-marked and ASME type safety valves.

1. Remove the water reservoir cover.
2. Unscrew the safety valve and remove it from the safety valve base.
3. Replace it with a new safety valve (ensure the safety valve is an original one!)
4. Test all autoclave.

ASME approved Type



CE marked Type



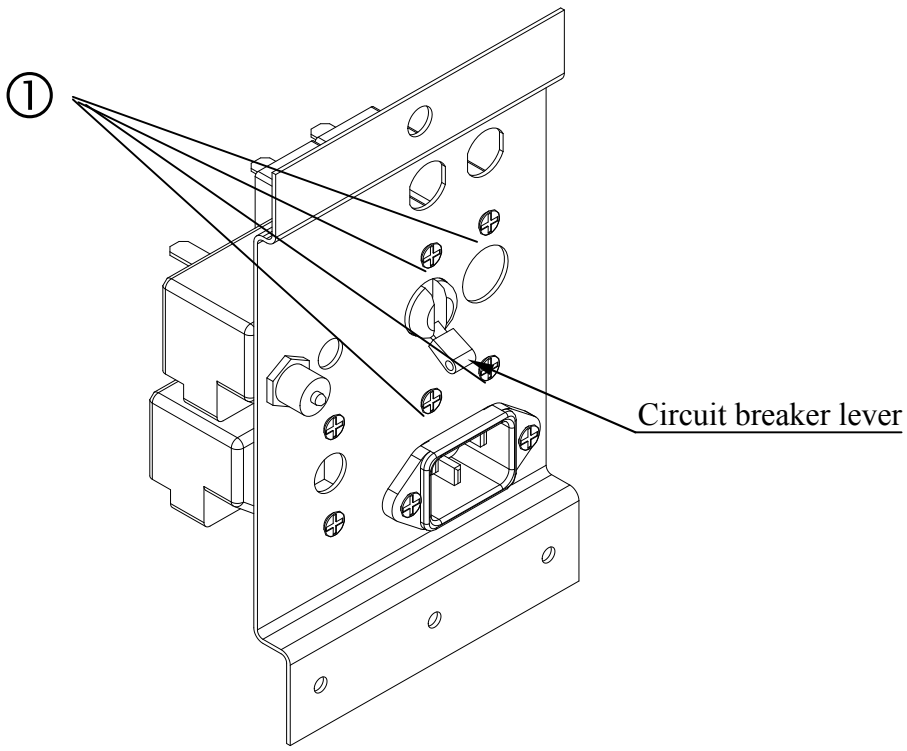
6.5 Replacing the circuit breaker

Caution!
Before starting, disconnect the instrument from the power source.

1. Remove the autoclave cover (see para. 6.2 “Dismantling the Outer Covers of the Autoclave**”**).
2. Disconnect the wires from the circuit breaker.
3. Remove the four screws connecting the circuit breaker to the panel (1).
4. Replace the circuit breaker with a new one.
5. Reconnect the electrical wires.
6. Reassemble the cover.
7. Turn on the autoclave and verify it operates correctly.
8. Move the circuit breaker’s lever to the “tripped” position and verify that the autoclave turns off.

Make sure that the correct circuit breaker is installed as marked in the table below!

Model / *Voltage*	*1730*		*2340*		*2540*		*3140*		*3850*	*3870*
	M	*MK MK-V*	*M*	*MK*	*M*	*MK*	*M*		*M*	*M*
							standard	*special*		
1ph, 120V, 50/60 Hz	15 A	15 A	15 A	—	15 A	—	—	—	—	—
1ph, 230V, 50/60 Hz	10 A	10 A	10 A	15 A	10 A	15 A	10 A	15 A	15 A	15 A



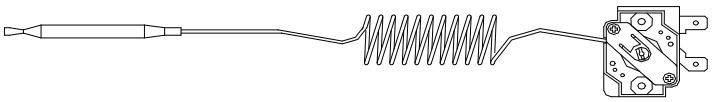
6.6 Temperature Safety Thermostat

(Located on the rear side of the heaters)

The autoclave is supplied with a temperature thermostat that maintains the temperature during the dry stage, by connecting and disconnecting the electric power.

This device automatically disconnects the heating elements in case of a rise in temperature.
The electric power is automatically reconnected when the chamber cools down.

- To replace this safety thermostat, remove the rear cover, unscrew the thermostat and replace it.

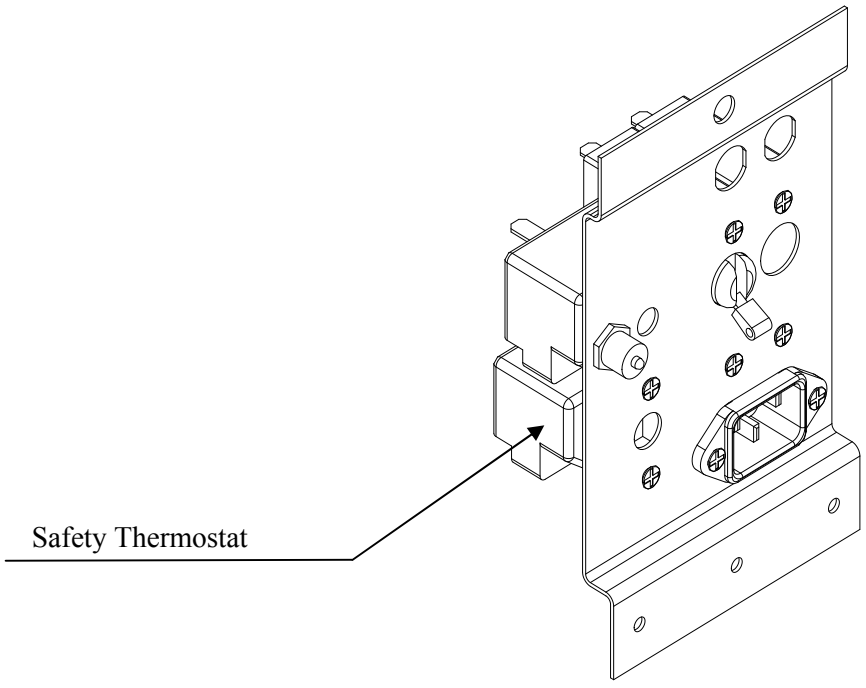


6.7 Raising the Working the Temperature of the Safety Thermostat

Caution:

Only authorized technician should do this operation!

1. Unscrew the rear cover of the autoclave.
2. With a screwdriver, turn the central screw slightly clockwise to raise the temperature.
3. Replace the rear cover.

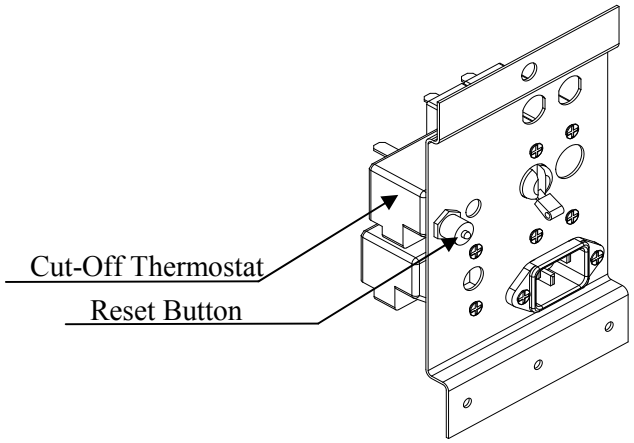


6.8 Cut-Off Thermostat

This thermostat cuts out power to the autoclave, in the event that all other safety systems do not function. For example: if the operator forgets to fill the chamber with water, and starts the sterilization cycle, the chamber will heat up and activate the cut-out thermostat. In order to restart the operation, press the RESET button. If the autoclave is operated according to the instructions, and the thermostat cuts off, a replace the thermostat.

The thermostat has been calibrated by the manufacturer of the autoclave.

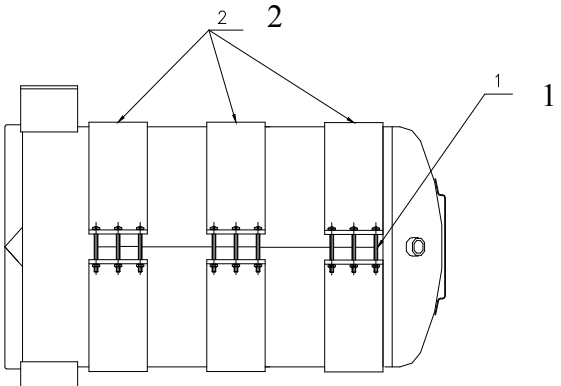
Do not attempt to re-calibrate it



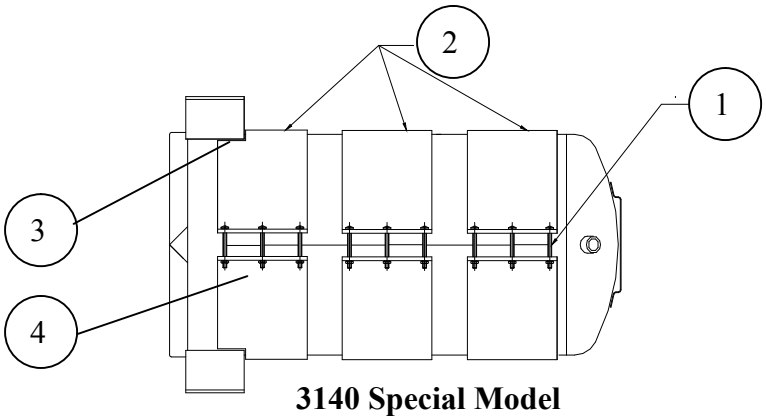
6.9 Replacing Heating Elements

Caution:
Before starting, ensure that the electric cord is disconnected from the power source and there is no pressure in the autoclave chamber.

1. Dismantle the autoclave cover (see para. 6.2 **"**Dismantling the Outer Covers of the Autoclave**"**).
2. Release the two terminal wires from the heating element.
3. Remove the heater tightening bolts (1).
4. Replace the damaged heating element with a new one and reconnect the two terminal wires.
   4.1 On the 3140M special model, the front heating element (3) (adjacent to the chamber's door) is with grooves (4). Assemble it with the grooves frontward.
5. Verify that the isolation material does not touch the electrical connections of the heating elements.
6. Verify that the electrical wires are well tightened with the connection screws.
7. Ensure that the heating element strap is well tightened to the autoclave body, ensuring proper heat dissipation from the heating element.
8. Re-assemble the autoclave cover.
9. Test all the autoclave cycles.



Standard Model



3140 Special Model

6.10 Replacing Multi-Purpose Valve

Caution:

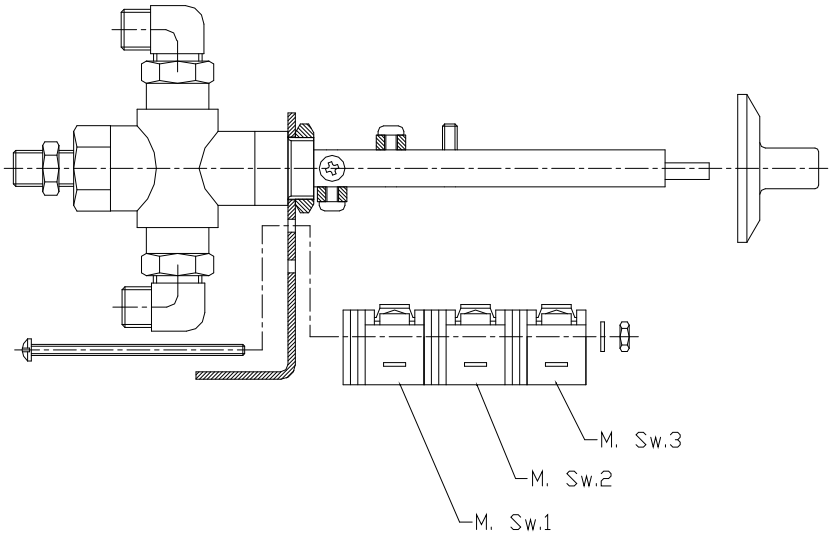
Before starting, make sure that the electric cord is disconnected from the power source and there is no pressure in the autoclave chamber.

1. Dismantle the autoclave cover (see para. 6.2 **"**Dismantling the Outer Covers of the Autoclave**"**).
2. Drain the water from the water reservoir.
3. Pull the valve knob out.
4. Unscrew the 3 nuts that tighten the copper tubes to the multi-purpose valve.
5. Unscrew the nut holding the valve to its base.
6. Pull out the valve.
7. Replace it with a new one. Make sure that the valve is tightened to the valve base.
8. Reconnect the three tube nuts.
9. Return the valve knob to its place.
10. Turn the valve knob to FILL position.
11. Pour water into the reservoir.
12. Check the copper tube connections for leakage.
13. Replace the cover and tighten it to the base.

Occasionally, it is necessary to take off the screws that are on the shaft of the valve in order to take the valve out of its base.

For Position of Micro-Switches see next page

After installing the new valve, the screws should be replaced according to drawing "Multi-Purpose Valve Assembly ".



Position of Micro-Switches and their Operation Situation				
M.Sw Stage	***-0-***	***Fill***	***Ste.***	***Exh. + Dry***
M.Sw.1	Tight	Tight	Loose	Loose
M.Sw.2	Loose	Loose	Loose	Tight
M.Sw.3	Loose	Loose	Loose	Tight

Notes:

1. Microswitches MSw1 - STER. and MSw. 2- DRY are actuated by the multi-purpose valve.
2. Microswitch MSw3 - Door Sw. is actuated by the door and is in pos. ON when the door is closed.

6.11 Unclogging the multi-Purpose Valve or Chamber

VERY IMPORTANT!

When sterilizing cotton wool or pads, it is essential to wrap them in paper or cotton bags in order to prevent the multi-purpose valve and the autoclave openings from becoming clogged with remnants of the material.

1. Pour distilled water into the chamber, according to quantities mentioned in the table below:

1730		**2340/2540**		**3140**		**3850**		**3870**	
10-12 oz	300-350 ml	12-15 oz	350-450 ml	14-16 oz	420-480 ml	20-23 oz	600-690 ml	24-27 oz	720-810 ml.

2. Close the door.
3. Turn the multi-purpose valve to STE. position.
4. Turn the timer knob to 20 min.
5. Turn the thermostat (B10) knob to either 250°F or 274°F° (121°C to 134°C).
6. Turn the main switch to START position.
7. After the timer has reached "0" turn the multi-purpose valve (clockwise) to the FILL position.

   In most cases, the pressure pushes the obstructing substance out, and the steam exhausts into the water reservoir.
8. When the pressure gauge reaches 0, turn the multi-purpose valve to the OFF position, and the main switch to STOP.
9. Open the door.
10. Replace the water in the water reservoir.

The autoclave is ready for the next cycle.

11. If this procedure does not clear up the clogging, replace the multi-purpose valve.

6.12 Pressure Door Lock System

This safety device prevents the door from opening when the chamber is pressurized.
The system is based on the built up pressure in the chamber that pushes the Silicon-rubber bellows and the pin into the grove of the tightening bolt. This prevents the operator from opening the door. When the steam is released, this bellow returns to its original position, drawing the pin with it thus releasing the tightening bolt.

Should there be no pressure in the chamber, and the door cannot be opened, the following procedure should be observed.

1. Turn the handle of the multi-purpose valve to EXH. & DRY.
2. The steam exhaust valve pipe is open and air inserts the chamber. In this stage the door can be opened.

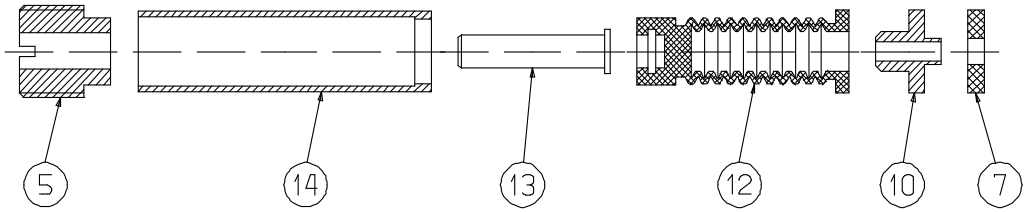
6.13 Replacing the Door Bellows

(Located in the Door Bridge)

Caution:

Before starting, be sure that there is no pressure in the autoclave chamber.

1. Open the door.
2. Unscrew and remove the tightening screw (5).
3. Gently pull out the door safety device locking pin (13).
4. It is possible that the washers (7, 10) will be stuck - if so, push them out by introducing pressurized air through the steam inlet hole.
5. Reconnect the door device locking pin (13) into a new silicone bellows (12).
6. Put the silicone bellows (12) and pin (13) into the bellows housing (14) and replace the washers (7, 10).
7. Reconnect all the above into the door bridge.
8. Re-screw and tighten the tightening screw (5).
9. Test all autoclave cycles.



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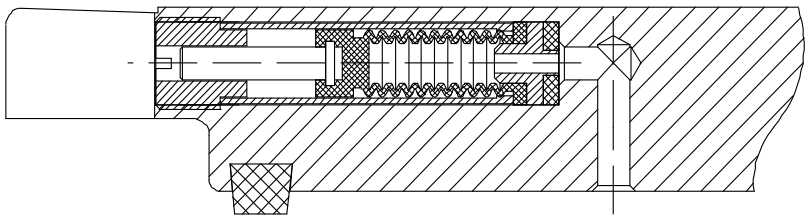
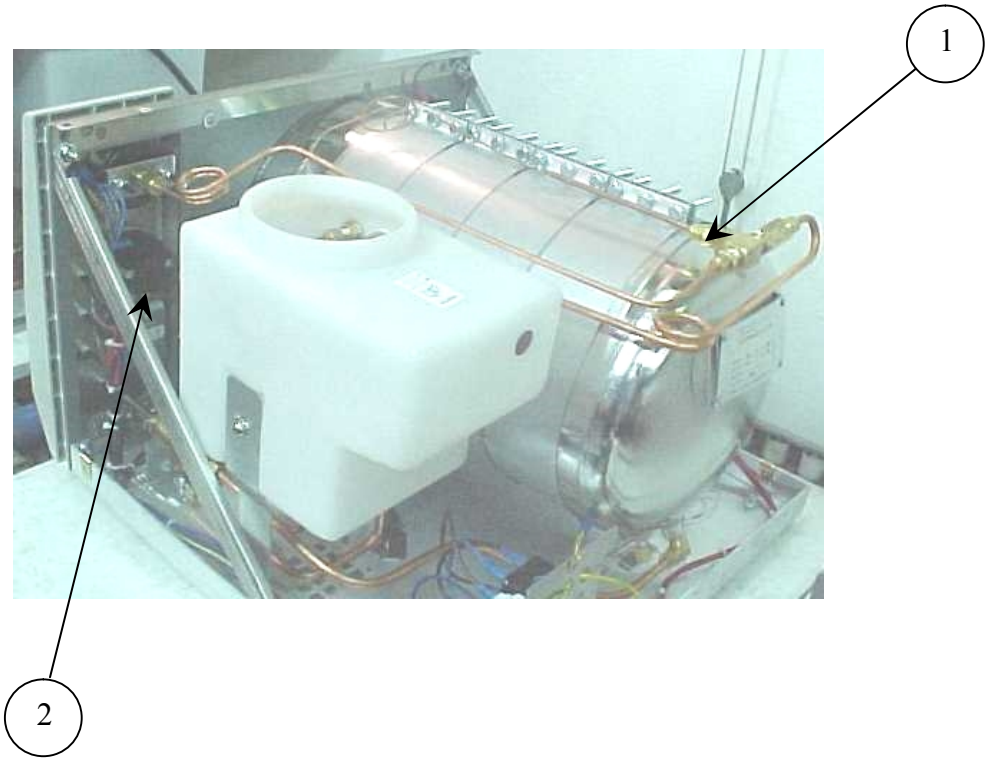


6.14 Replacing the thermostat B10

Caution:
Before starting, be sure that the electric cord is disconnected from the power source and that there is no pressure in the autoclave chamber.

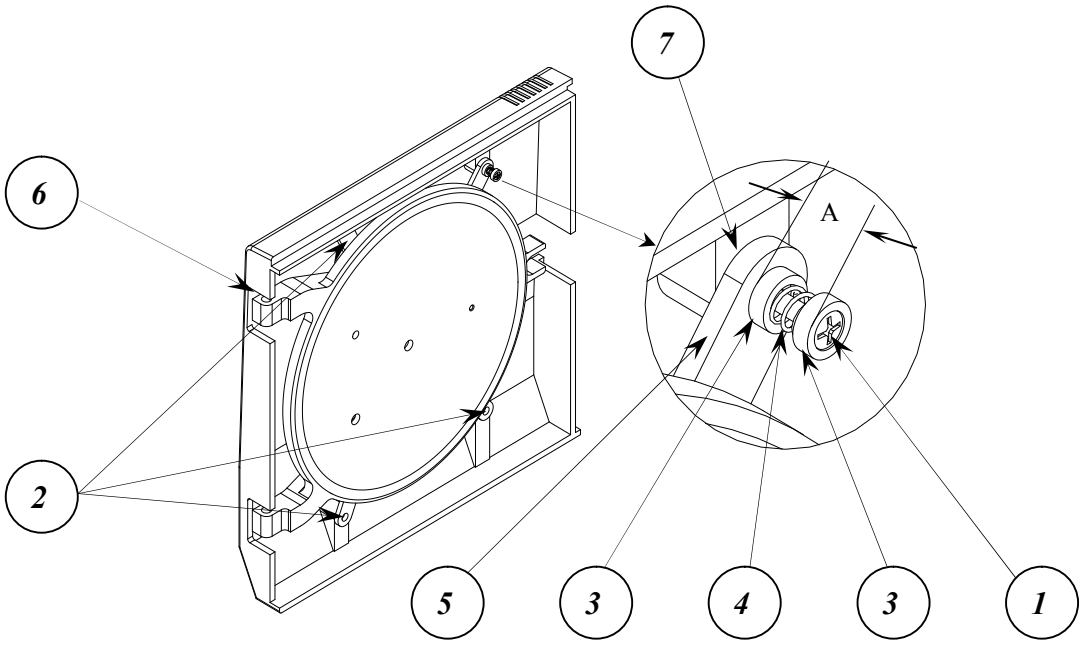
1. Remove the autoclave cover (see para. 6.2 **"**Dismantling the Outer Covers of the Autoclave**"**).
2. Unscrew the nut (1) connecting the pressure pipe (the pipe connecting the thermostat to the chamber).
3. Remove the isolating cover.
4. Remove the thermostat knob.
5. Unscrew the 2 screws connecting the thermostat to the panel (located under the thermostat knob).
6. Unscrew the nuts connecting the wires to the thermostat (2).
7. Remove the thermostat and replace it with a new one.
8. Reconnect the electrical wires.
9. Reassemble the thermostat to the panel.
10. Reassemble the knob and the pressure pipe.
11. Re-assemble the isolating and the autoclave cover.
12. Test and calibrate the pressure switch.
13. Test all the autoclave cycles and verify it operates correctly.



6.15 Replacement of the Door Cover

Caution:
Before starting, be sure that the electric cord is disconnected from the power source and that there is no pressure in the autoclave chamber.

1. Unscrew the four screws attaching the door cover and remove the door cover. Since the screw pressing the door microswitch includes two washers and a spring, be aware not to lose them.
2. Reassemble the new cover.
3. When assembling covers on models 3850/3870 place a washer (7) between the door cover (6) and the door flange (5) – on all 4 flanges (in the drawing below the washer is hidden).
4. To assemble the screw that is pressing the door switch, insert screw (1) until dimension A is approximately 15 mm.
   4.1 Please note that on model 3140 two washers (3) are placed between the spring (4) and the door.
5. Perform final adjustment of the screw as follows:
   5.1 While the autoclave is disconnected from electricity turn on the circuit breaker.
   5.2 Connect the electrical plug to a multi-meter.
   5.3 Press the microswitch and verify that the microswitch functions as required.
   5.4 Close the door and verify that the microswitch operates.
   5.5 If the microswitch does not operate unscrew the screw one turn counter- clockwise and check per para. 4.4. Repeat until microswitch operates.
   5.6 Connect the autoclave to electricity.
   5.7 Close the door until the microswitch indicates that the door is closed. Operate the autoclave and verify that there is no steam or pressure leak.
   5.8 If there is steam leak, stop the autoclave's operation, reduce steam pressure, open the door and turn the screw one turn clockwise and check per para. 5.7. Repeat until leakage ceases.
6. After assembling the door cover stick the model label (see spare parts list) in the sunken surface.



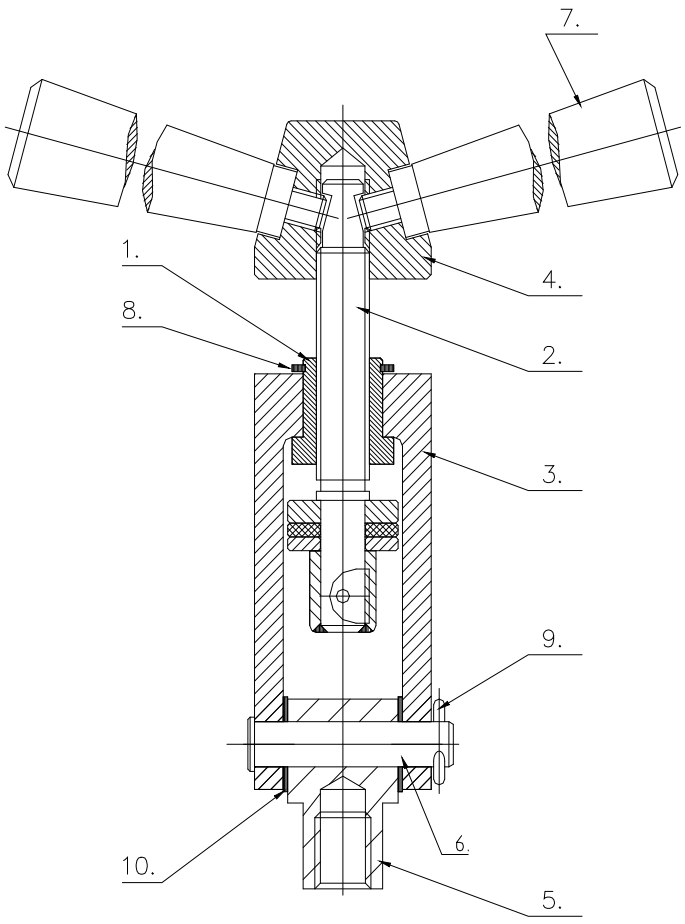
No.	Description	Model	Cat. No.	No.	Description	Model	Cat. No.
1	screw	2340, 2540	BOL191-0032	3	washer	All models	ELE036-0009
		1730, 3140 3850, 3870	BOL191-0091	4	spring	All models	SPR177-0012
2	screw	1730	BOL191-0140	6	door cover	1730	POL065-0001
		2340, 2540	BOL191-0033			2340, 2540	POL065-0053
		3140	BOL191-0115			3140	POL065-0007
		3850, 3870	BOL191-0082			3850, 3870	POL065-0044
				7	washer (hidden)	3850, 3870	NUT193-0270

6.16 Replacing the Locking Device

Caution:
Before starting, verify that there is no pressure in the autoclave chamber.

1. Remove the security ring (9) using a special tool.
2. Remove pin (6).
3. Remove locking device. Take care not to lose the Teflon disk (10).
4. Reassemble the new locking device.
5. Insert the pin (6).
6. Reassemble the security ring (9).

CLOSING DEVICE



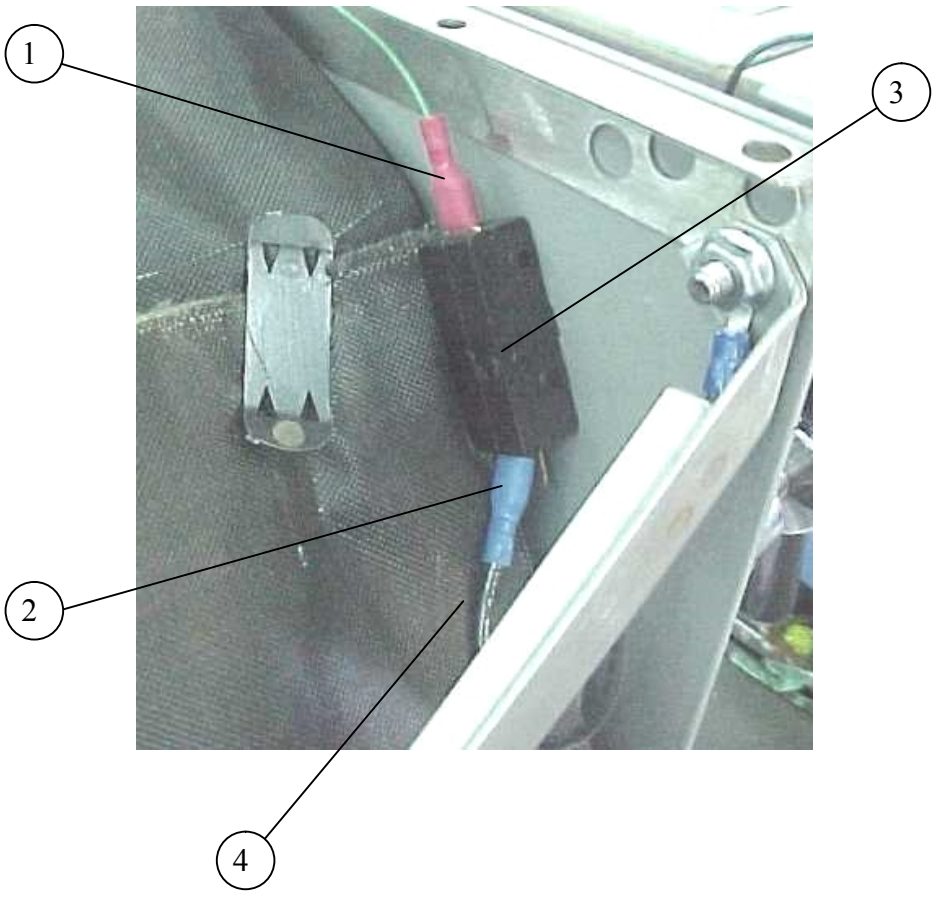
No.	*Description*	*No.*	*Description*
1	Bushing	6	Door locking device pin
2	Door tightening bolt assembly	7	Bakelite handle
3	Locking screw housing	8	Closing bridge “c” clip
4	Locking base	9	Cotter pin
5	Locking housing axis	10	Teflon disk

6.17 Replacing the Door Switch (models 2540, 3150, 3850, 3870)

Caution!

Before starting, disconnect the instrument from the power source and ensure that there is no pressure in the autoclave.
Allow the autoclave to cool before removing outer covers.

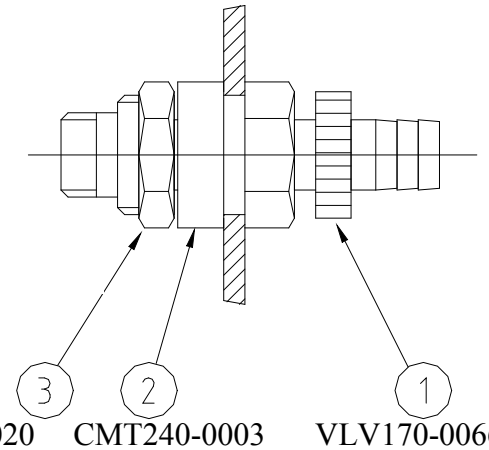
1. Remove the autoclave cover (see para. 6.2 **"**Dismantling the Outer Covers of the Autoclave**"**).
2. Disconnect the wires (1), (2) from the door switch (3).
3. Remove the microswitch and replace it with a new one.
4. Reconnect the wires the microswitch. Verify that the wire is placed on the isolating cover (4) and does not touch the chamber.
5. Reassemble the door cover.
6. Test the connection with an ohmmeter. In "open" position the ohmmeter shows disconnection and in "close" position the ohmmeter shows connection.



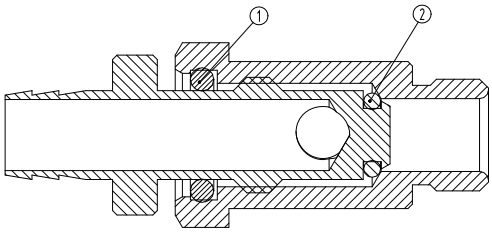
6.18 Replacing the Drain Valve

Caution!
Before starting, disconnect the instrument from the power source and ensure that there is no pressure in the autoclave.
Allow the autoclave to cool before removing outer covers.

1. Remove the autoclave cover (see para. 6.2 **"**Dismantling the Outer Covers of the Autoclave**"**).
2. Disconnect the drainpipe from the valve, using a 9/16**"** wrench.
3. Remove the nut (3) and the "ring for drain valve" (2).
4. Remove the drain valve (1) from the panel.
5. Install a new valve according to the drawing below.
6. Verify that there is no leakage.



CMT240-0020 CMT240-0003 VLV170-0066



Item	*Cat No.*
1	GAS082-0020
2	GAS082-0021

7 TROUBLESHOOTING

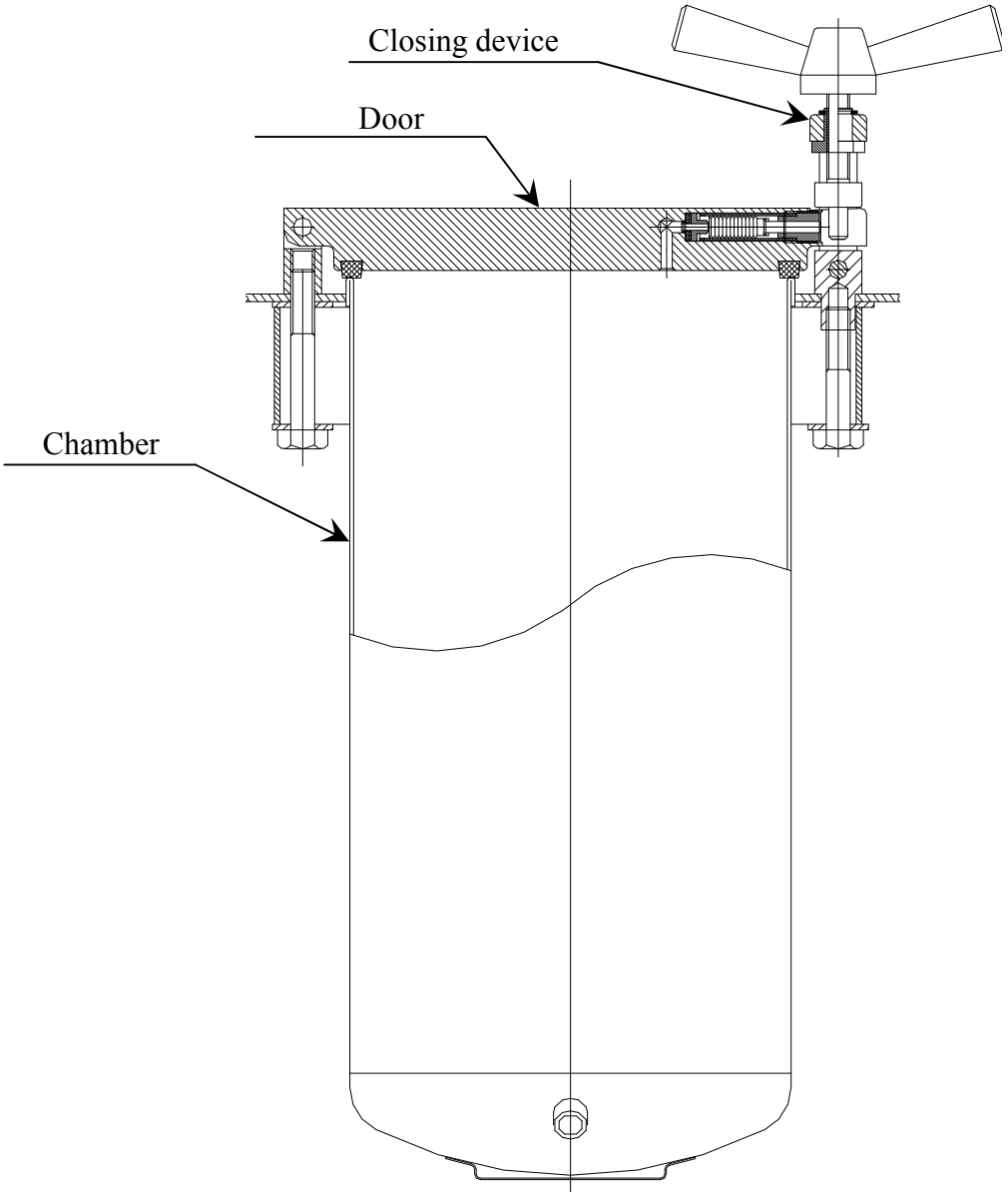
Symptom	*Possible cause check-up and tests*	*Corrections*
1. Multi-purpose valve is in FILL position. Water does not enter into the chamber.	1.1 Multi-purpose valve of chamber is clogged. 1.2 The pipe is clogged.	1.1 Follow instructions in para. 6.10. 1.2 Follow instructions in para. 6.10.
2. While main switch is in START position, power is supplied, C.B. in ON position, POWER indicator light does not light up.	2.1 Main Switch is defective. 2.2 Set timer for 15 minutes. Turn the multi-purpose valve to "DRY" position. If "HEAT" & "DRY" lights are on then "POWER" bulb is burnt. 2.3 If also "HEAT" & "DRY" lights are not on then the electrical line is faulty. 2.4 Turn the multi-purpose valve to the "Exh/Dry" position and set the timer to 15 minutes. If the "Dry" light is on then the "Power" light is burned out. When finished turn the timer back to 0 minutes 2.5 The "Dry" light does not come on.	2.1 Check and replace it if necessary. 2.2 Replace "POWER" bulb. 2.3 Check and repair the line from the entry until the main switch. 2.4 Replace the "Power" light. 2.5 Check out the unit for an internal electrical problem.

Symptom	*Possible cause check-up and tests*	*Corrections*
3. Multi-purpose valve is in STE. position, main switch in ON position. Timer and thermostat (B10) are in any working position and the door is closed tightly.	3.1.1 Burnt bulb.	3.1.1 Replace faulty bulb.
3.1 "HEAT" light is not on but the autoclave operates.	3.2.1 Thermostat (B10) set to too low temperature 3.2.2 Microswitch No.2 is faulty. 3.2.3 Bridge No. 10 is faulty.	3.2.1 Adjust the thermostat (B10). 3.2.2 Replace the faulty Microswitch. 3.2.3 Fix the bridge.
3.2 "HEAT" light is not on and heating is insufficient.	3.3.1 Thermostat (B10) is faulty. 3.3.2 Safety thermostat faulty. 3.3.3 Timer is faulty.	3.3.1 Fix or replace the faulty thermostat (B10). 3.3.2 Fix or replace the faulty thermostat. 3.3.3 Fix or replace the faulty timer.
3.3 "HEAT" light is not on and there is no heating.	3.3.4 Microswitch No.3 is faulty. 3.3.5 Thermostat (B10) is faulty. 3.3.6 Door switch is faulty.	3.3.4 Fix or replace the faulty microswitch. 3.3.5 Fix or replace the faulty thermostat (B10). 3.3.6 Fix or replace the faulty door switch.
4. Multi-purpose valve on STE. position. POWER and HEAT indicator lights are lit. and water level is as specified Temperature and pressure are not sufficient.	4.1 Thermostat (B10) is not calibrated. 4.2 Steam escapes from safety valve. 4.3 Air trap jet hole leaks excessively. 4.4 Steam escapes from the door seal. 4.5 Steam escapes from piping connections.	4.1 Calibrate the thermostat (B10). 4.2 Pull safety valve ring for 2 seconds, then release. If leakage continues, replace it. 4.3 Replace the air trap jet. 4.4 Tighten door locking bolt. If leakage persists, replace door seal. 4.5 Locate leakage and repair faulty piping connection.

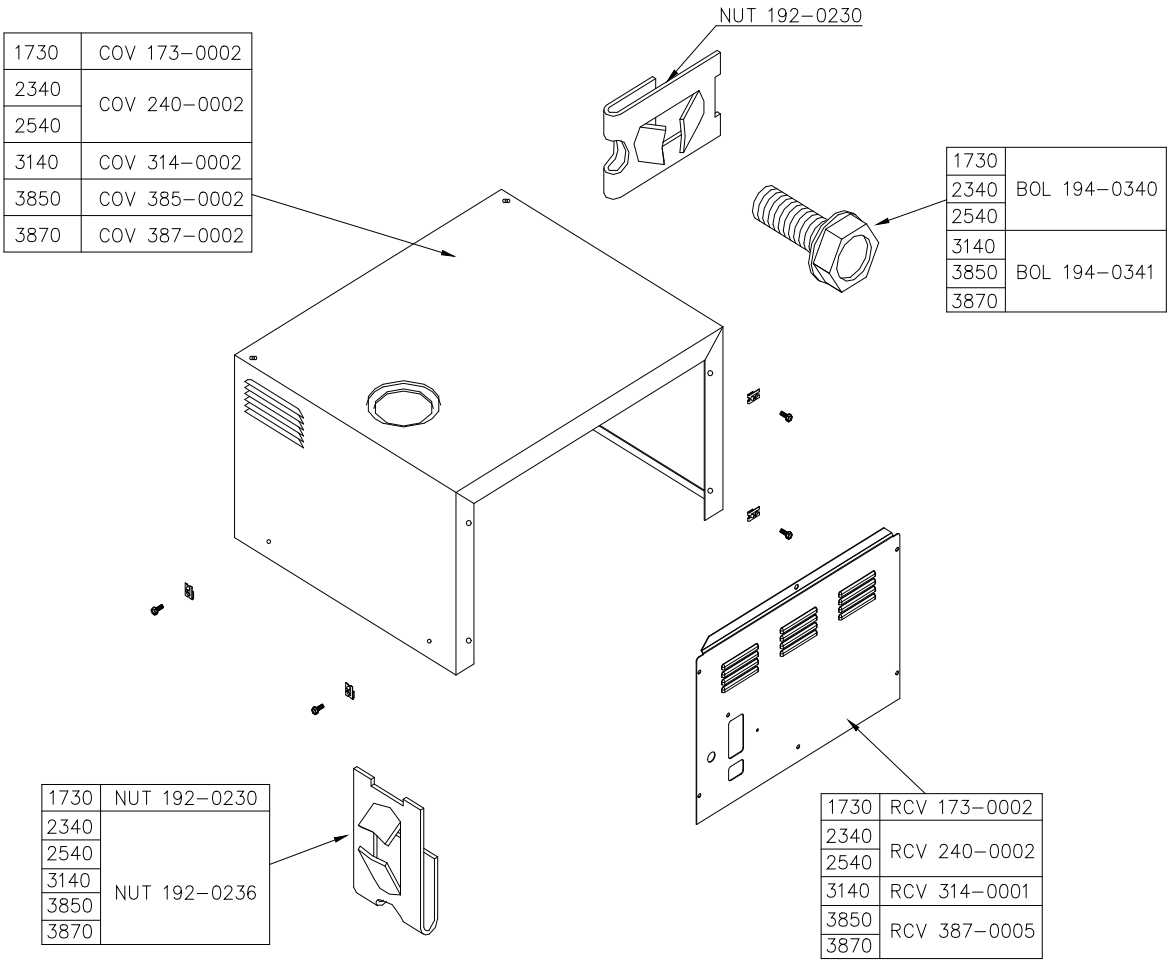
Symptom	*Possible cause check-up and tests*	*Corrections*
5. Pressure builds up very slowly.	5.1 One or more heaters are burnt.	5.1 Check and replace heaters if necessary.
	5.2 Too much water in the chamber.	5.2 Check if chamber holds the correct amount of water (see para. 6.11).
	5.3 Door gasket leakage.	5.3 Tighten a bit more, if leakage continues, replace gasket.
	5.4 Safety thermostat is not set to the right temp (stops heating in the “increase pressure” stage).	5.4 Calibrate the thermostat.
	5.5 Steam is leaking at the closing device	5.5 Door bellows is leaking. Replace the bellows.
	5.6 Safety Valve is leaking	5.6 Activate the safety valve (see "Operation & Maintenance Manual". If leaking persists replace the Safety valve.
6. Temperature safety device is activated during the ste. cycles due to overheating and water amount is sufficient.	6.1 The thermostat is not set to the right temperature.	6.1 Set the thermostat to the right temperature.
	6.2 Multi-purpose valve is leaking. Water returns to water reservoir.	6.2 Replace the valve (see para. 6.10).
	6.3 Safety valve is leaking.	6.3 Replace the safety valve (see para. 6.4).
	6.4 Air trap jet leaks excessively.	6.4 Replace air jet (see para. 6.3)
7. Autoclave in STE. position. Pressure safety valve is activated and heating continues.	7.1 Faulty thermostat (B10) does not stop heating when reaching required temp.	7.1 Fix or replace the thermostat (B10).
	7.2 Pressure safety valve is faulty.	7.2 Replace the Pressure safety valve.

Symptom	*Possible cause check-up and tests*	*Corrections*
8. Dry indicator light does not light up at the beginning of the dry cycle. The Power light is on and the unit does heat up.	8.1 The “Dry” light is burned out.	8.1 Replace the “Dry” light.
9. Door handle cannot be turned counter clockwise for opening.	9.1 Door pin set in groove. 9.2 Door locking system stuck or bellows damaged.	9.1 Slightly turn handle in closing direction (clockwise), then attempt to open. 9.2 If problem persists, refer to “Pressure Door Lock System”. After opening the door, replace the bellows.
10. Items in the chamber are burning or melting.	10.1 Steam is leaking at the closing device. 10.2 Safety Valve is leaking.	10.1 Door bellows is leaking. Replace the bellows. 10.2 Activate the safety valve (see "Operation & Maintenance Manual". If leaking persists replace the Safety valve.
11. Multi-purpose valve turns backwards.	11.1 The internal spring in the multi-purpose valve has broken.	11.1 Replace the multi-purpose valve.
12. Multi-purpose valve does not turn.	12.1 Poor maintenance will result in the multi-purpose valve binding.	12.1 Replace the multi-purpose valve.
13. Timer does not time down.	13.1 Internal gearing has worn down.	13.1 Replace the timer.
14. Timer bell does not ring.	14.1 The hammer on the timer bell has broken off.	14.1 Replace the timer.

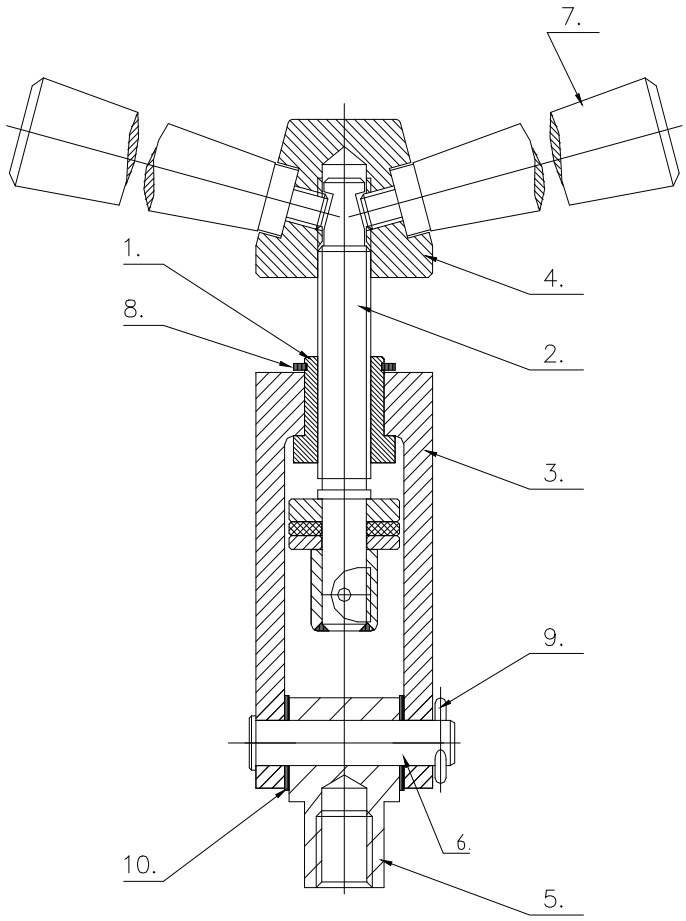
GENERAL VIEW OF VESSEL, DOOR AND ACCESSORIES



AUTOCLAVE COVER



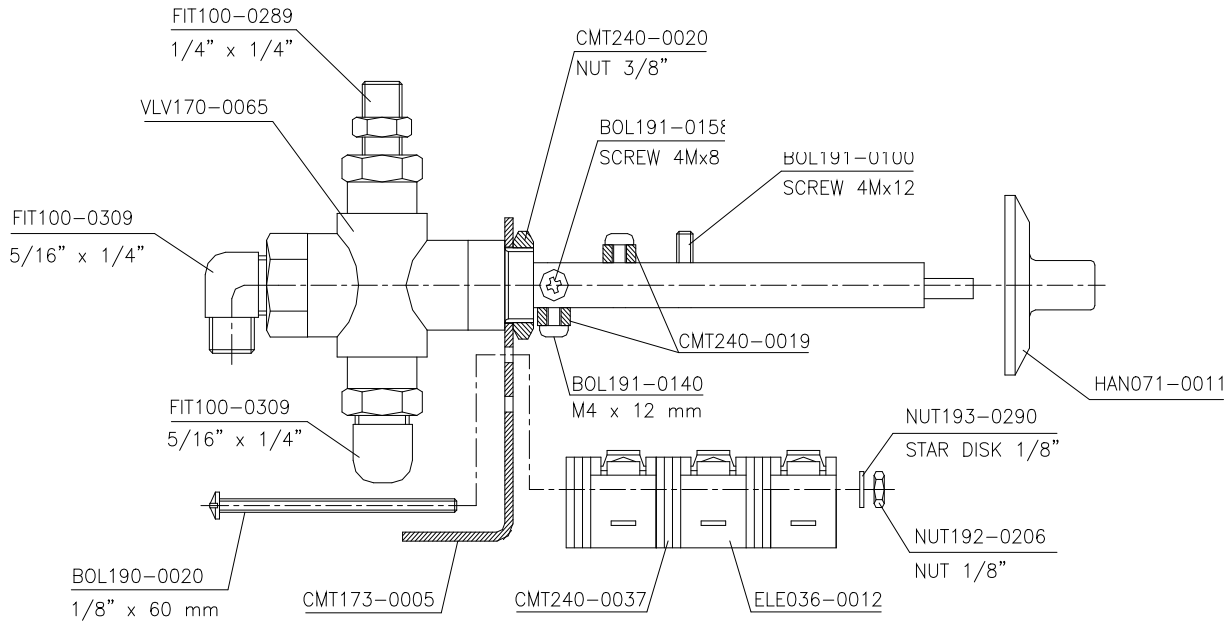
DOOR TIGHTENING BOLT – ASSEMBLY



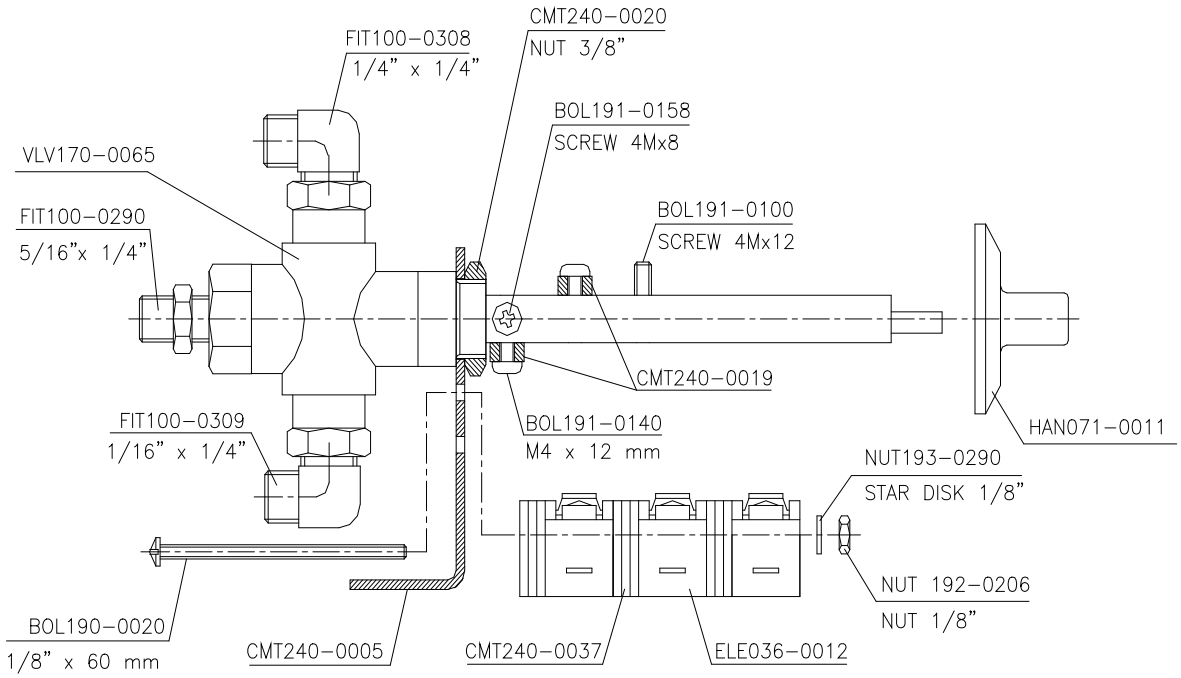
No.	*Description*	*Cat. No.*	
		1730, 2340, 2540	*3140, 3850, 3870*
1	Bushing	LOK240-0003	LOK387-0003
2	Door tightening bolt assembly	LOK240-0034	LOK387-0007
3	Locking screw housing	LOK240-0005	LOK387-0006
4	Locking base	LOK240-0030	LOK387-0012
5	Locking housing axis	LOK240-0014	LOK387-0014
6	Door locking device pin	LOK240-0019	LOK387-0016
7	Bakelite handle	HAN071-0003	HAN071-0006
8	Closing bridge “c” clip	NUT193-0339	NUT193-0300
9	Cotter pin	LOK692-0039	LOK692-0039
10	Okolon disc	LOK240-0017	LOK387-0017
	Bushing (1) + Locking screw housing (3) + Closing bridge “c” clip (8)	LOK240-0002	LOK387-0002
	Tightening bolt , Door w/o locking solenoid, assembly	LOK240-0001	LOK387-0032

MULTI-PURPOSE VALVE ASSEMBLY

Model 1730



Models 2340/2540/3140/3850/3870



8 LIST OF SPARE PARTS

Description	*Cat. No.*					
	1730	*2340*	*2540*	*3140*	*3850*	*3870*
Thermostat, Cut-Off, TY95-H, Campini	**THE005-0014**	**THE005-0014**	**THE005-0014**	**THE005-0014**	**THE005-0014**	**THE005-0014**
Thermostat, Safety, 180C, TY95/AC, Campini	**THE005-0003**	**THE005-0003**	**THE005-0003**	**THE005-0003**	**THE005-0003**	**THE005-0003**
Heating Element, 120V, 350W 1730 M/E	**HEA009-0001**	—	—	—	—	—
Heating Element, 120V, 350W 2340 M/E	—	**HEA009-0002**	—	—	—	—
Heating Element, 120V, 350W 2540 M/E	—	—	**HEA009-0017**	—	—	—
Heating Element, 230V, 350W, 1730 M/E	**HEA009-0004**	—	—	—	—	—
Heating Element, 230V, 350W, 2340 M/E	—	**HEA009-0005**	—	—	—	—
Heating Element, 230V, 350W, 2540 M/E	—	—	**HEA009-0006**	—	—	—
Heating Element, 120V, 450W, 1730 MK/EK	**HEA010-0007**	—	—	—	—	—
Heating Element, 230V, 450W, 1730 MK/EK	**HEA010-0008**	—	—	—	—	—
Heating Element, 230V, 550W, 2340 MK/EK	—	**HEA010-0003**	—	—	—	—
Heating Element, 230V, 550W, 2540 MK/EK	—	—	**HEA010-0004**	—	—	—
Heating Element 230V 600W 3140 M/E	—	—	—	**HEA009-0014**	—	—
Special Model Heating Element 230V 800W 3140 M/E, w/o groove	—	—	—	**HEA009-0015**	—	—
Special Model Heating Element 230V 800W 3140 M/E, with groove	—	—	—	**HEA009-0016**	—	—
Heating Element, 230V, 600W, 3850 M/E	—	—	—	—	**HEA009-0007**	—
Heating Element, 230V, 500W, 3870 M/E	—	—	—	—	—	**HEA009-0008**
Heating Element, 240V, 350W, 1730 M/E	**HEA009-0009**	—	—	—	—	—
Heating Element, 240V, 350W, 2340 M/E	—	**HEA009-0010**	—	—	—	—
Heating Element, 240V, 350W, 2540 M/E	—	—	**HEA009-0011**	—	—	—
Heating Element, 240V, 450W, 1730 MK/EK	**HEA010-0010**	—	—	—	—	—
Heating Element, 240V, 550W, 2340 MK/EK	—	**HEA010-0005**	—	—	—	—
Heating Element, 240V, 550W, 2540 MK/EK	—	—	**HEA010-0006**	—	—	—

Description		Cat. No.					
		1730	*2340*	*2540*	*3140*	*3850*	*3870*
Heating Element, 240V, 800W, 3850 M/E		——	——	——	——	**HEA009-0012**	——
Heating Element, 240V, 600W, 3870 M/E		——	——	——	——	——	**HEA009-0013**
Circuit Breaker, 1PH, 10A, Carlingswitch		**ELE035-0069**	**ELE035-0069**	**ELE035-0069**	**ELE035-0069**	—	—
Circuit Breaker, Rail, 1PH, 15A, Carlingswitch		**ELE035-0021**	**ELE035-0021**	**ELE035-0021**	**ELE035-0021**	**ELE035-0021**	**ELE035-0021**
Circuit Breaker, 1-PH, 25A, Carlingswitch		—	—	—	**ELE035-0060**	—	—
Timer, Mechanical, 0-60 min, Faucigny		**ELE033-0001**	**ELE033-0001**	**ELE033-0001**	**ELE033-0001**	**ELE033-0001**	**ELE033-0001**
Switch, Rocker, 16A		**ELE035-0012**	**ELE035-0012**	**ELE035-0012**	**ELE035-0012**	**ELE035-0012**	**ELE035-0012**
Microswitch, E13-00M, 15A, 125/250VAC, 3/4HP, Cheery		**ELE036-0001**	**ELE036-0001**	**ELE036-0001**	**ELE036-0001**	**ELE036-0001**	**ELE036-0001**
Microswitch, E11-00-H, Cheery		**ELE036-0002**	**ELE036-0002**	**ELE036-0002**	**ELE036-0002**	**ELE036-0002**	**ELE036-0002**
Lamp, Orange, 110V, 8mm		**ELE038-0003**	**ELE038-0003**	**ELE038-0003**	**ELE038-0003**	**ELE038-0003**	**ELE038-0003**
Lamp, Orange, 230V, 8mm		**ELE038-0006**	**ELE038-0006**	**ELE038-0006**	**ELE038-0006**	**ELE038-0006**	**ELE038-0006**
Lamp, Green, 110V, 8mm		**ELE038-0002**	**ELE038-0002**	**ELE038-0002**	**ELE038-0002**	**ELE038-0002**	**ELE038-0002**
Lamp, Green, 230V, 8mm		**ELE038-0005**	**ELE038-0005**	**ELE038-0005**	**ELE038-0005**	**ELE038-0005**	**ELE038-0005**
Gauge, Pressure, Steam, 0-60 psi, Red Pointer		—	**GAU029-0005**	**GAU029-0005**	**GAU029-0005**	**GAU029-0005**	**GAU029-0005**
Gauge, Pressure, Steam, 0-60 psi, 1.5"		**GAU029-0008**	—	—	—	—	—
Handle, Door, Bakelite for TTA (522)		**HAN071-0003**	**HAN071-0003**	**HAN071-0003**	**HAN071-0006**	**HAN071-0006**	**HAN071-0006**
Knob, Timer		**HAN071-0011**	**HAN071-0011**	**HAN071-0011**	**HAN071-0011**	**HAN071-0011**	**HAN071-0011**
Knob, Thermostat (B10)		**HAN071-0012**	**HAN071-0012**	**HAN071-0012**	**HAN071-0012**	**HAN071-0012**	**HAN071-0012**
Cover, Door		**POL065-0001**	**POL065-0053**	**POL065-0053**	**POL065-0007**	**POL065-0044**	**POL065-0044**
Label, Door	M	—	**LAB048-0289**	**LAB048-0295**	—	**LAB048-0250**	**LAB048-0249**
	MK	—	**LAB048-0290**	**LAB048-0296**	—	—	—
Dipstick, Reservoir, Water, Superp.		**POL067-0005**	**POL067-0005**	**POL067-0005**	**POL067-0005**	**POL067-0005**	**POL067-0005**
Cover, Reservoir, Water, Superp.		**POL067-0004**	**POL067-0004**	**POL067-0004**	**POL067-0004**	**POL067-0004**	**POL067-0004**
Bellows, Door Lock		**GAS080-0020**	**GAS080-0020**	**GAS080-0020**	**GAS080-0020**	**GAS080-0020**	**GAS080-0020**
Gasket, Door, Blue, 1730		**GAS080-0197**	—	—	—	—	—
Gasket, Door, Red, 2340		—	**GAS080-0196**	—	—	—	—
Gasket, Door, Black, 2540		—	—	**GAS080-0184**	—	—	—

Description			Cat. No.					
			1730	*2340*	*2540*	*3140*	*3850*	*3870*
Gasket, Door, Gray, 31XX			—	—	—	**GAS080-0195**	—	—
Gasket, Door, Green, 38XX			—	—	—	—	**GAS080-0198**	**GAS080-0198**
Disc, Silicone, Door Bellows			**GAS080-0006**	**GAS080-0006**	**GAS080-0006**	**GAS080-0006**	**GAS080-0006**	**GAS080-0006**
Gasket, Silicone, Water Reservoir			**GAS080-0007**	**GAS080-0007**	**GAS080-0007**	**GAS080-0007**	**GAS080-0007**	**GAS080-0007**
Cable, Plug+Socket 230V 10A, EUR			**WIR040-0003**	**WIR040-0003**	**WIR040-0003**	**WIR040-0003**	**WIR040-0003**	**WIR040-0003**
Cable, Plug+Socket 110V 15A, USA			**WIR040-0004**	**WIR040-0004**	**WIR040-0004**	**WIR040-0004**	**WIR040-0004**	**WIR040-0004**
Cable, Plug+Socket 220V 15A, USA			**WIR040-0005**	**WIR040-0005**	**WIR040-0005**	**WIR040-0005**	**WIR040-0005**	**WIR040-0005**
Multi-purpose valve assy. complete with harness			**CMT173-0033**	**CMT240-0028**	**CMT240-0028**	**CMT314-0006**	**CMT385-0005**	**CMT387-0027**
Multi-purpose valve with M.Sw.			**CMT173-0026**	**CMT240-0046**	**CMT240-0046**	**CMT240-0046**	**CMT240-0046**	**CMT240-0046**
Valve, Multipurpose, Assembly+Base			**CMT173-0027**	**CMT240-0016**	**CMT240-0016**	**CMT240-0016**	**CMT240-0016**	**CMT240-0016**
Valve, Multi-Purpose			**VLV170-0065**	**VLV170-0065**	**VLV170-0065**	**VLV170-0065**	**VLV170-0065**	**VLV170-0065**
Harness, Electrical, Valve, Multipurpose			**ELE032-0020**	**ELE032-0001**	**ELE032-0001**	**ELC314-0005**	**ELC385-0006**	**ELC387-0015**
Safety valve	CE marked 1/4 x 2.8 Bar		**SVL029-0119**	**SVL029-0119**	**SVL029-0119**	**SVL029-0119**	**SVL029-0119**	**SVL029-0119**
	ASME 1/4"-40 psi		**SVL029-0090**	**SVL029-0090**	**SVL029-0090**	**SVL029-0090**	**SVL029-0090**	**SVL029-0090**
Air Jet, Red		MK	**CMT100-0003**	**CMT100-0003**	**CMT100-0003**	**CMT100-0003**	**CMT100-0006**	**CMT100-0006**
Air Jet, Black		M	**CMT100-0006**	**CMT100-0006**	**CMT100-0006**			
Tube, Multi-purpose valve to chamber, 2340/2540 M			**PIP234-0006**	**PIP234-0006**	**PIP234-0006**	**PIP234-0006**	**PIP234-0006**	**PIP234-0006**
Socket for electric cord, 15A			**WIR040-0016**	**WIR040-0016**	**WIR040-0016**	—	—	—
Socket for electric cord, 10A			**WIR040-0003**	**WIR040-0003**	**WIR040-0003**	—	—	—
Leg, Front, TTA			**WHE070-0012**	**WHE070-0012**	**WHE070-0012**	—	—	—
Leg, Front, Long, TTA			—	—	—	**WHE070-0013**	**WHE070-0013**	**WHE070-0013**
Leg, Rubber, Plug Type, 25x1/4			**WHE070-0016**	**WHE070-0016**	**WHE070-0016**	**WHE070-0016**	**WHE070-0016**	**WHE070-0016**
Reservoir, Water, Assembly			**CMT173-0025**	**CMT240-0025**	**CMT240-0025**	**CMT240-0025**	**CMT387-0024**	**CMT387-0024**
Cover, Outer			**COV173-0002**	**COV240-0002**	**COV240-0002**	**COV314-0002**	**COV385-0002**	**COV387-0002**
Rear cover			**RCV173-0002**	**RCV240-0002**	**RCV240-0002**	**RCV314-0001**	**RCV387-0005**	**RCV387-0005**
Drain valve			**VLV170-0066**	**VLV170-0066**	**VLV170-0066**	**VLV170-0066**	**VLV170-0066**	**VLV170-0066**
Brass spacer for drain valve			**CMT240-0003**	**CMT240-0003**	**CMT240-0003**	**CMT240-0003**	**CMT240-0003**	**CMT240-0003**
Nut for drain valve			**CMT240-0020**	**CMT240-0020**	**CMT240-0020**	**CMT240-0020**	**CMT240-0020**	**CMT240-0020**

Description		*Cat. No.*					
		1730	***2340***	***2540***	***3140***	***3850***	***3870***
O-Ring (drain valve) 10 x 2.5		**GAS082-0020**	**GAS082-0020**	**GAS082-0020**	**GAS082-0020**	**GAS082-0020**	**GAS082-0020**
O-Ring (drain valve) 6 x 2		**GAS082-0021**	**GAS082-0021**	**GAS082-0021**	**GAS082-0021**	**GAS082-0021**	**GAS082-0021**
Autoclave vessel		**ASM173-0001**	**ASM234-0001**	**ASM254-0001**	**CHM314-0000**	**ASM385-0001**	**ASM387-0001**
Door Assembly		**DOR173-1000**	**DOR234-1000**	**DOR254-0000**	**DOR314-0000**	**DOR387-0001**	**DOR387-0001**
Cooling coil		**PIP254-0041**	**PIP254-0041**	**PIP254-0041**	**PIP254-0041**	**PIP387-0068**	**PIP387-0068**
Bushing for selector valve		**CMT240-0019**	**CMT240-0019**	**CMT240-0019**	**CMT240-0019**	**CMT240-0019**	**CMT240-0019**
Microswitch D48X		**ELE036-0012**	**ELE036-0012**	**ELE036-0012**	**ELE036-0012**	**ELE036-0012**	**ELE036-0012**
Tightening Nut, Door Locking Bellows		**LOK240-0026**	**LOK240-0026**	**LOK240-0026**	**LOK240-0026**	**LOK240-0026**	**LOK240-0026**
Safety membrane housing		**LOK240-0025**	**LOK240-0025**	**LOK240-0025**	**LOK240-0025**	**LOK240-0025**	**LOK240-0025**
Bellows pin		**L0K240-0023**	**L0K240-0023**	**L0K240-0023**	**L0K240-0023**	**L0K240-0023**	**L0K240-0023**
Bushing (1) + Locking screw housing (3) + Closing bridge “c” clip (8)		**LOK240-0002**	**LOK240-0002**	**LOK240-0002**	**LOK387-0002**	**LOK387-0002**	**LOK387-0002**
Door tightening bolt – assembly		**LOK240-0001**	**LOK240-0001**	**LOK240-0001**	**LOK387-0032**	**LOK387-0032**	**LOK387-0032**
Inner bushing for bellow		**CMT067-0002**	**CMT067-0002**	**CMT067-0002**	**CMT067-0002**	**CMT067-0002**	**CMT067-0002**
Thermostat, B10, Robert Show		**THE005-0002**	**THE005-0002**	**THE005-0002**	**THE005-0002**	**THE005-0002**	**THE005-0002**
Control panel	Upper	**CPN064-0025**	**CPN064-0022**	**CPN064-0022**	**CPN064-0023**	**CPN064-0023**	**CPN064-0023**
	Lower				**CPN064-0024**	**CPN064-0024**	**CPN064-0024**

9 PRESSURE VS TEMPERATURE FOR SATURATED STEAM

psia	InHg	°F	Bar	kPa	°C
1.5	2.95	114.5	0.10	10	45.8
2.2	4.44	129.3	0.15	15	54.1
2.9	5.90	140.2	0.20	20	60.1
3.6	7.39	149.1	0.25	25	65.0
4.4	8.86	156.4	0.30	30	68.9
5.1	10.34	162.9	0.35	35	72.7
5.8	11.81	168.6	0.40	40	75.9
6.5	13.30	173.8	0.45	45	78.8
7.3	14.76	178.4	0.50	50	81.3

psia	psig	°F	Bar	kPa	°C
14.7	0.0	212.0	1.01	101.3	100.0
14.8	0.1	212.2	1.02	101.7	100.1
14.8	0.1	212.4	1.02	102.1	100.2
14.9	0.2	212.5	1.02	102.4	100.3
14.9	0.2	212.7	1.03	102.8	100.4
15.0	0.3	212.9	1.03	103.2	100.5
15.0	0.3	213.1	1.04	103.6	100.6
15.1	0.4	213.3	1.04	104.0	100.7
15.1	0.4	213.4	1.04	104.3	100.8
15.2	0.5	213.6	1.05	104.7	100.9
15.2	0.5	213.8	1.05	105.1	101.0
15.3	0.6	214.0	1.05	105.4	101.1
15.4	0.7	214.2	1.06	105.8	101.2
15.4	0.7	214.3	1.06	106.2	101.3
15.5	0.8	214.5	1.07	106.6	101.4
15.5	0.8	214.7	1.07	106.9	101.5
15.6	0.9	214.9	1.07	107.3	101.6
15.6	0.9	215.1	1.08	107.7	101.7
15.7	1.0	215.2	1.08	108.1	101.8
15.7	1.0	215.4	1.08	108.4	101.9
15.8	1.1	215.6	1.09	108.8	102.0
15.8	1.1	215.8	1.09	109.2	102.1
15.9	1.2	216.0	1.10	109.6	102.2
16.0	1.3	216.3	1.10	110.0	102.4
16.1	1.4	216.5	1.11	110.7	102.5
16.1	1.4	216.7	1.11	111.1	102.6
16.2	1.5	216.9	1.12	111.5	102.7
16.2	1.5	217.0	1.12	111.9	102.8
16.3	1.6	217.2	1.12	112.3	102.9
16.4	1.7	217.4	1.13	112.7	103.0
16.4	1.7	217.6	1.13	113.1	103.1
16.5	1.8	217.8	1.14	113.5	103.2
16.5	1.8	217.9	1.14	114.0	103.3
16.6	1.9	218.1	1.14	114.3	103.4
16.6	1.9	218.3	1.15	114.7	103.5
16.7	2.0	218.5	1.15	115.1	103.6
16.8	2.1	218.7	1.16	115.6	103.7
16.8	2.1	218.8	1.16	116.0	103.8
16.9	2.2	219.0	1.16	116.3	103.9
16.9	2.2	219.2	1.17	116.7	104.0
17.0	2.3	219.4	1.17	117.1	104.1
17.1	2.4	219.6	1.18	117.5	104.2

psia	psig	°F	Bar	kPa	°C
17.1	2.4	219.7	1.18	117.9	104.3
17.2	2.5	219.9	1.18	118.6	104.4
17.2	2.5	220.1	1.19	118.6	104.5
17.3	2.6	220.3	1.19	119.3	104.6
17.4	2.7	220.5	1.20	120.0	104.7
17.4	2.7	220.6	1.20	120.0	104.8
17.5	2.8	220.8	1.20	120.4	104.9
17.5	2.8	221.0	1.21	120.7	105.0
17.6	2.9	221.2	1.21	121.3	105.1
17.7	3.0	221.4	1.22	122.0	105.2
17.7	3.0	221.5	1.22	122.0	105.3
17.8	3.1	221.7	1.23	122.7	105.4
17.8	3.1	221.9	1.23	122.7	105.5
17.9	3.2	222.1	1.23	123.4	105.6
18.0	3.3	222.3	1.24	124.1	105.7
18.0	3.3	222.4	1.24	124.1	105.8
18.1	3.4	222.6	1.24	124.7	105.9
18.2	3.5	222.8	1.25	125.1	106.0
18.2	3.5	223.0	1.26	125.5	106.1
18.3	3.6	223.2	1.26	126.0	106.2
18.3	3.6	223.3	1.26	126.2	106.3
18.4	3.7	223.5	1.27	126.8	106.4
18.5	3.8	223.7	1.27	127.2	106.5
18.5	3.8	223.9	1.28	127.7	106.6
18.6	3.9	224.1	1.28	128.1	106.7
18.6	3.9	224.2	1.29	128.5	106.8
18.7	4.0	224.4	1.29	129.0	106.9
18.8	4.1	224.6	1.29	129.6	107.0
18.9	4.2	224.8	1.30	129.9	107.1
18.9	4.2	225.0	1.30	130.4	107.2
19.0	4.3	225.1	1.31	130.8	107.3
19.0	4.3	225.3	1.31	131.3	107.4
19.1	4.4	225.5	1.32	131.7	107.5
19.2	4.5	225.7	1.32	132.2	107.6
19.3	4.6	225.9	1.33	132.6	107.7
19.3	4.6	226.0	1.33	133.1	107.8
19.4	4.7	226.2	1.34	133.5	107.9
19.4	4.7	226.4	1.34	134.0	108.0
19.5	4.8	226.6	1.34	134.4	108.1
19.6	4.9	226.8	1.35	134.9	108.2
19.6	4.9	226.9	1.35	135.3	108.3
19.7	5.0	227.1	1.36	135.8	108.4
19.8	5.1	227.3	1.36	136.2	108.5
19.8	5.1	227.5	1.37	136.7	108.6
19.9	5.2	227.7	1.37	137.1	108.7
19.9	5.2	227.8	1.38	137.6	108.8
20.0	5.3	228.0	1.38	138.1	108.9
20.1	5.4	228.2	1.39	138.5	109.0
20.2	5.5	228.4	1.39	139.0	109.1
20.3	5.6	228.6	1.39	139.5	109.2
20.3	5.6	228.7	1.40	140.0	109.3
20.4	5.7	228.9	1.40	140.5	109.4
20.4	5.7	229.1	1.41	140.9	109.5

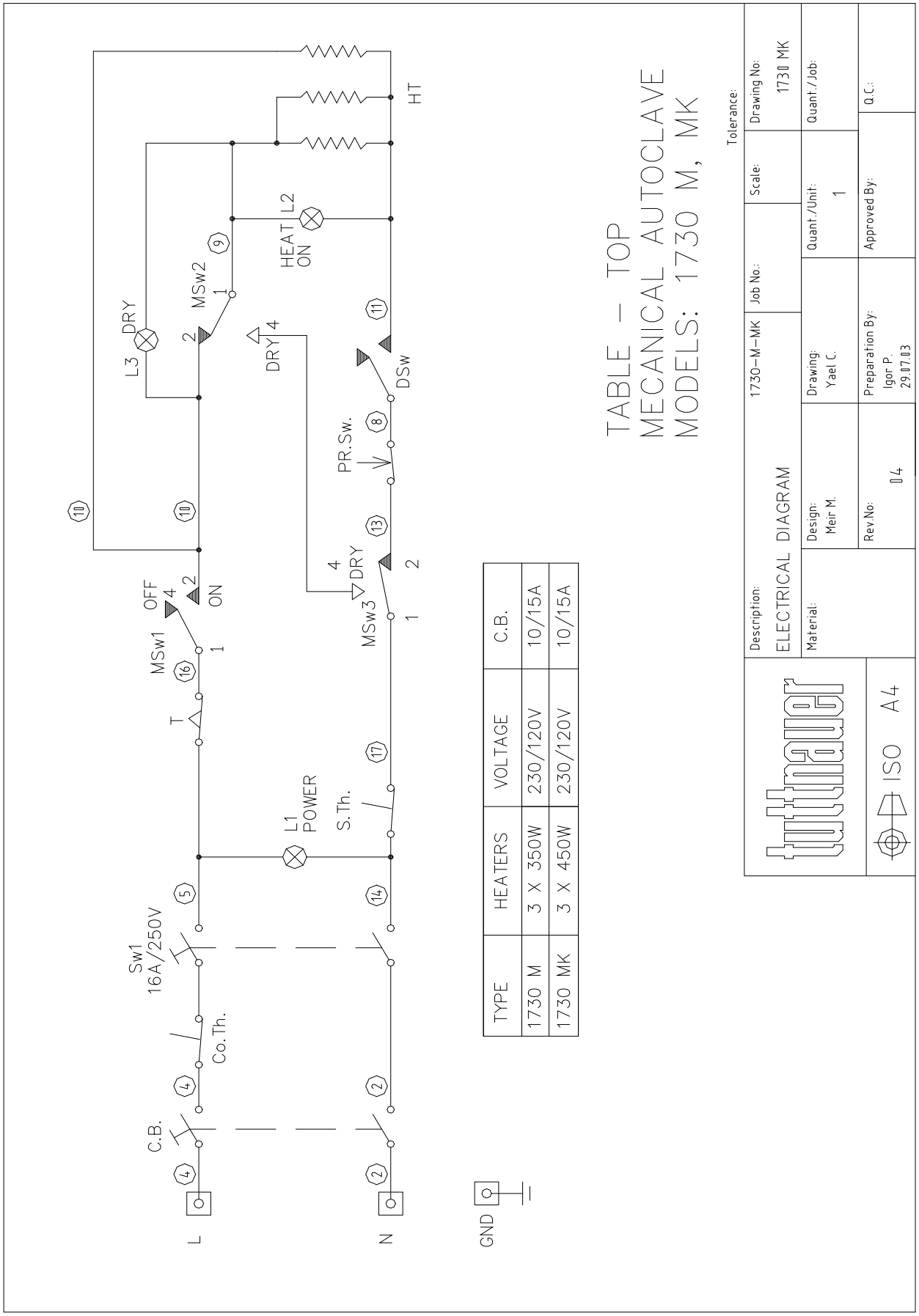
psia	*psig*	*°F*	*Bar*	*kPa*	*°C*	*psia*	*psig*	*°F*	*Bar*	*kPa*	*°C*
20.5	5.8	229.3	1.41	141.4	109.6	24.6	9.9	239.2	1.70	169.7	115.1
20.6	5.9	229.5	1.42	142.0	109.7	24.7	10.0	239.4	1.70	170.2	115.2
20.6	5.9	229.6	1.42	142.4	109.8	24.7	10.0	239.5	1.71	170.8	115.3
20.7	6.0	229.8	1.43	142.9	109.9	24.8	10.1	239.7	1.71	171.3	115.4
20.8	6.1	230.0	1.43	143.3	110.0	24.9	10.2	239.9	1.72	171.8	115.5
20.9	6.2	230.2	1.44	143.9	110.1	25.0	10.3	240.1	1.72	172.4	115.6
21.0	6.3	230.4	1.44	144.3	110.2	25.1	10.4	240.3	1.73	173.1	115.7
21.0	6.3	230.5	1.45	144.8	110.3	25.2	10.5	240.4	1.74	173.6	115.8
21.1	6.4	230.7	1.45	145.3	110.4	25.3	10.6	240.6	1.74	174.1	115.9
21.1	6.4	230.9	1.46	145.8	110.5	25.3	10.6	240.8	1.75	174.7	116.0
21.2	6.5	231.1	1.46	146.2	110.6	25.4	10.7	241.0	1.75	175.3	116.1
21.3	6.6	231.3	1.47	146.7	110.7	25.5	10.8	241.2	1.76	175.9	116.2
21.3	6.6	231.4	1.47	147.2	110.8	25.6	10.9	241.3	1.76	176.4	116.3
21.4	6.7	231.6	1.48	147.7	110.9	25.7	11.0	241.5	1.77	177.0	116.4
21.5	6.8	231.8	1.48	148.2	111.0	25.8	11.1	241.7	1.78	177.6	116.5
21.6	6.9	232.0	1.49	148.6	111.1	25.9	11.2	241.9	1.78	178.2	116.6
21.7	7.0	232.2	1.49	149.6	111.2	25.9	11.2	242.1	1.79	178.7	116.7
21.7	7.0	232.3	1.50	149.6	111.3	26.0	11.3	242.2	1.79	179.3	116.8
21.8	7.1	232.5	1.50	150.3	111.4	26.1	11.4	242.4	1.80	180.0	116.9
21.9	7.2	232.7	1.51	151.0	111.5	26.2	11.5	242.6	1.80	180.5	117.0
21.9	7.2	232.9	1.51	151.0	111.6	26.3	11.6	242.8	1.81	181.1	117.1
22.0	7.3	233.1	1.52	151.7	111.7	26.4	11.7	243.0	1.82	181.6	117.2
22.1	7.4	233.2	1.52	152.2	111.8	26.4	11.7	243.1	1.82	182.2	117.3
22.1	7.4	233.4	1.53	152.7	111.9	26.5	11.8	243.3	1.83	182.8	117.4
22.2	7.5	233.6	1.53	153.2	112.0	26.6	11.9	243.5	1.83	183.4	117.5
22.3	7.6	233.8	1.54	153.8	112.1	26.7	12.0	243.7	1.84	184.0	117.6
22.4	7.7	234.0	1.54	154.3	112.2	26.8	12.1	243.9	1.85	184.5	117.7
22.4	7.7	234.1	1.55	154.8	112.3	26.8	12.1	244.0	1.85	185.1	117.8
22.5	7.8	234.3	1.55	155.3	112.4	26.9	12.2	244.2	1.86	185.7	117.9
22.6	7.9	234.5	1.56	155.8	112.5	27.0	12.3	244.4	1.86	186.3	118.0
22.7	8.0	234.7	1.56	156.3	112.6	27.1	12.4	244.6	1.87	186.9	118.1
22.8	8.1	234.9	1.57	156.8	112.7	27.2	12.5	244.8	1.88	187.5	118.2
22.8	8.1	235.0	1.57	157.3	112.8	27.3	12.6	244.9	1.88	188.2	118.3
22.9	8.2	235.2	1.58	157.9	112.9	27.4	12.7	245.1	1.89	188.8	118.4
23.0	8.3	235.4	1.58	158.4	113.0	27.5	12.8	245.3	1.89	189.4	118.5
23.1	8.4	235.6	1.59	158.9	113.1	27.6	12.9	245.5	1.90	190.0	118.6
23.1	8.4	235.8	1.59	159.4	113.2	27.7	13.0	245.7	1.91	190.6	118.7
23.2	8.5	235.9	1.60	159.9	113.3	27.7	13.0	245.8	1.91	191.2	118.8
23.3	8.6	236.1	1.60	160.4	113.4	27.8	13.1	246.0	1.92	191.8	118.9
23.4	8.7	236.3	1.61	160.0	113.5	27.9	13.2	246.2	1.92	192.4	119.0
23.4	8.7	236.5	1.62	161.5	113.6	28.0	13.3	246.4	1.93	193.0	119.1
23.5	8.8	236.7	1.62	162.1	113.7	28.1	13.4	246.6	1.94	193.7	119.2
23.6	8.9	236.8	1.63	162.6	113.8	28.2	13.5	246.7	1.94	194.3	119.3
23.7	9.0	237.0	1.63	163.1	113.9	28.3	13.6	246.9	1.95	194.9	119.4
23.7	9.0	237.2	1.64	163.7	114.0	28.4	13.7	247.1	1.95	195.5	119.5
23.8	9.1	237.4	1.64	164.2	114.1	28.5	13.8	247.3	1.96	196.1	119.6
23.9	9.2	237.6	1.65	164.8	114.2	28.6	13.9	247.5	1.97	196.7	119.7
24.0	9.3	237.7	1.65	165.3	114.3	28.6	13.9	247.6	1.97	197.3	119.8
24.1	9.4	237.9	1.66	165.9	114.4	28.7	14.0	247.8	1.98	197.9	119.9
24.1	9.4	238.1	1.66	166.4	114.5	28.8	14.1	248.0	1.99	198.5	120.0
24.2	9.5	238.3	1.67	167.0	114.6	28.9	14.2	248.2	1.99	199.2	120.1
24.3	9.6	238.5	1.67	167.5	114.7	29.0	14.3	248.4	2.00	199.8	120.2
24.4	9.7	238.6	1.68	168.0	114.8	29.1	14.4	248.5	2.00	200.5	120.3
24.4	9.7	238.8	1.69	168.6	114.9	29.2	14.5	248.7	2.01	201.1	120.4
24.5	9.8	239.0	1.69	169.1	115.0	29.3	14.6	248.9	2.02	201.8	120.5

psia	*psig*	*°F*	*Bar*	*kPa*	*°C*	*psia*	*psig*	*°F*	*Bar*	*kPa*	*°C*
29.4	14.7	249.1	2.02	202.4	120.6	34.6	19.9	258.6	2.39	238.7	125.9
29.5	14.8	249.3	2.03	203.1	120.7	34.7	20.0	258.8	2.39	239.4	126.0
29.5	14.8	249.4	2.04	203.7	120.8	34.8	20.1	259.0	2.40	240.2	126.1
29.6	14.9	249.6	2.04	204.4	120.9	34.9	20.2	259.2	2.41	240.9	126.2
29.7	15.0	249.8	2.05	205.0	121.0	35.0	20.3	259.3	2.42	241.6	126.3
29.8	15.3	250.0	2.06	205.7	121.1	35.1	20.4	259.5	2.42	242.3	126.4
29.9	15.4	250.2	2.06	206.3	121.2	35.3	20.6	259.7	2.43	243.1	126.5
30.0	15.5	250.3	2.07	207.0	121.3	35.4	20.7	259.9	2.44	243.8	126.6
30.1	15.6	250.5	2.08	207.6	121.4	35.5	20.8	260.1	2.45	244.5	126.7
30.3	15.6	250.7	2.08	208.3	121.5	35.6	20.9	260.2	2.45	245.3	126.8
30.5	15.8	250.9	2.09	208.9	121.6	35.7	21.0	260.4	2.46	246.0	126.9
30.5	15.8	251.1	2.10	209.6	121.7	35.8	21.1	260.6	2.47	246.8	127.0
30.6	15.9	251.2	2.10	210.2	121.8	35.9	21.2	260.8	2.48	247.6	127.1
30.7	16.0	251.4	2.11	210.8	121.9	36.0	21.3	261.0	2.48	248.3	127.2
30.8	16.1	251.6	2.11	211.5	122.0	36.1	21.4	261.1	2.49	249.1	127.3
31.0	16.3	251.8	2.12	212.1	122.1	36.2	21.5	261.3	2.50	249.9	127.4
31.0	16.3	252.0	2.13	212.8	122.2	36.5	21.8	261.5	2.51	250.6	127.5
31.1	16.4	252.1	2.13	213.5	122.3	36.5	21.8	261.7	2.51	251.4	127.6
31.2	16.5	252.3	2.14	214.2	122.4	36.6	21.9	261.9	2.52	252.2	127.7
31.3	16.6	252.5	2.15	214.8	122.5	36.7	22.0	262.0	2.53	252.9	127.8
31.4	16.7	252.7	2.16	215.2	122.6	36.8	22.1	262.2	2.54	253.7	127.9
31.5	16.8	252.9	2.16	216.2	122.7	36.9	22.2	262.4	2.54	254.5	128.0
31.6	16.9	253.0	2.17	216.9	122.8	37.0	22.3	262.6	2.55	255.2	128.1
31.7	17.0	253.2	2.18	217.6	122.9	37.1	22.4	262.8	2.56	256.0	128.2
31.8	17.1	253.4	2.18	218.3	123.0	37.2	22.5	262.9	2.57	256.8	128.3
31.8	17.1	253.6	2.19	218.9	123.1	37.4	22.7	263.1	2.58	257.5	128.4
31.9	17.2	253.8	2.20	219.6	123.2	37.5	22.8	263.3	2.58	258.3	128.5
32.0	17.3	253.9	2.20	220.3	123.3	37.6	22.9	263.5	2.59	259.1	128.6
32.1	17.4	254.1	2.21	221.0	123.4	37.7	23.0	263.7	2.60	259.8	128.7
32.2	17.5	254.3	2.22	221.7	123.5	37.8	23.1	263.8	2.61	260.6	128.8
32.3	17.6	254.5	2.22	222.4	123.6	37.9	23.2	264.0	2.61	261.4	128.9
32.4	17.7	254.7	2.23	223.1	123.7	38.0	23.3	264.2	2.62	262.2	129.0
32.5	17.8	254.8	2.24	223.7	123.8	38.1	23.4	264.4	2.63	263.0	129.1
32.6	17.9	255.0	2.24	224.4	123.9	38.3	23.6	264.6	2.64	263.8	129.2
32.6	17.9	255.2	2.25	225.1	124.0	38.4	23.7	264.7	2.65	264.6	129.3
32.7	18.0	255.4	2.26	225.8	124.1	38.5	23.8	264.9	2.65	265.4	129.4
32.8	18.1	255.6	2.26	226.5	124.2	38.6	23.9	265.1	2.66	266.2	129.5
32.9	18.2	255.7	2.27	227.2	124.3	38.7	24.0	265.3	2.67	267.0	129.6
33.0	18.3	255.9	2.28	227.9	124.4	38.8	24.1	265.5	2.68	267.8	129.7
33.1	18.4	256.1	2.29	228.6	124.5	39.0	24.3	265.6	2.69	268.6	129.8
33.3	18.6	256.3	2.29	229.3	124.6	39.1	24.4	265.8	2.69	269.4	129.9
33.4	18.7	256.5	2.30	230.0	124.7	39.2	24.5	266.0	2.70	270.3	130.0
33.5	18.8	256.6	2.31	230.7	124.8	39.3	24.6	266.2	2.71	271.1	130.1
33.6	18.9	256.8	2.31	231.5	124.9	39.4	24.7	266.4	2.72	271.9	130.2
33.7	19.0	257.0	2.32	232.2	125.0	39.5	24.8	266.5	2.73	272.7	130.3
33.8	19.1	257.2	2.33	232.9	125.1	39.7	25.0	266.7	2.73	273.5	130.4
33.9	19.2	257.4	2.34	233.6	125.2	39.8	25.1	266.9	2.74	274.3	130.5
34.0	19.3	257.5	2.34	234.4	125.3	39.9	25.2	267.1	2.75	275.1	130.6
34.1	19.4	257.7	2.35	235.1	125.4	40.0	25.3	267.3	2.76	275.9	130.7
34.2	19.5	257.9	2.36	235.8	125.5	40.1	25.4	267.4	2.77	276.7	130.8
34.3	19.6	258.1	2.37	236.5	125.6	40.3	25.6	267.6	2.78	277.5	130.9
34.4	19.7	258.3	2.37	237.3	125.7	40.4	25.7	267.8	2.78	278.3	131.0
34.5	19.8	258.4	2.38	238.0	125.8	40.5	25.8	268.0	2.79	279.1	131.1

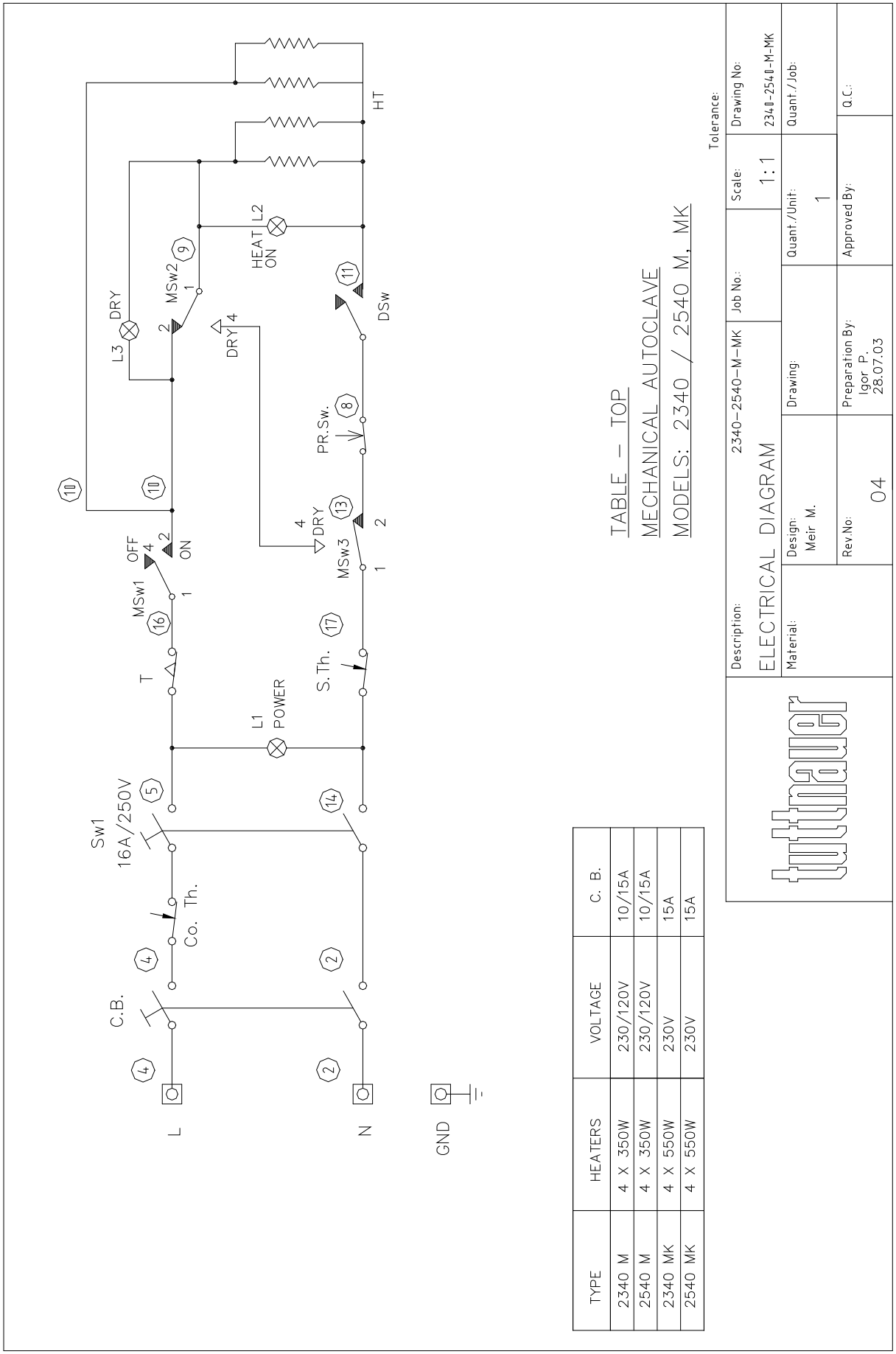
psia	*psig*	*°F*	*Bar*	*kPa*	*°C*	*psia*	*psig*	*°F*	*Bar*	*kPa*	*°C*
40.6	25.9	268.2	2.80	280.0	131.2	45.7	31.2	275.4	3.15	315.0	135.2
40.7	26.0	268.3	2.81	280.9	131.3	45.8	31.3	275.5	3.16	315.9	135.3
40.9	26.2	268.5	2.82	281.7	131.4	45.9	31.5	275.7	3.17	316.8	135.4
41.0	26.3	268.7	2.83	282.6	131.5	46.1	31.6	275.9	3.18	317.7	135.5
41.1	26.4	268.9	2.83	283.4	131.6	46.2	31.7	276.1	3.19	318.6	135.6
41.2	26.5	269.1	2.84	284.3	131.7	46.3	31.9	276.2	3.20	319.5	135.7
41.4	26.7	269.2	2.85	285.1	131.8	46.5	32.0	276.4	3.20	320.5	135.8
41.5	26.8	269.4	2.86	286.0	131.9	46.6	32.1	276.6	3.21	321.4	135.9
41.6	26.9	269.6	2.87	286.8	132.0	46.8	32.3	276.8	3.22	322.4	136.0
41.7	27.0	269.8	2.88	287.7	132.1	46.9	32.4	277.0	3.23	323.3	136.1
41.8	27.1	270.0	2.89	288.5	132.2	47.0	32.6	277.2	3.24	324.3	136.2
42.0	27.3	270.1	2.89	289.4	132.3	47.2	32.7	277.3	3.25	325.2	136.3
42.1	27.4	270.3	2.90	290.2	132.4	47.3	32.8	277.5	3.26	326.2	136.4
42.2	27.5	270.5	2.91	291.1	132.5	47.4	33.0	277.7	3.27	327.1	136.5
42.3	27.6	270.7	2.92	291.9	132.6	47.6	33.1	277.9	3.28	328.1	136.6
42.5	27.8	270.9	2.93	292.8	132.7	47.7	33.2	278.1	3.29	329.0	136.7
42.6	27.9	271.0	2.94	293.6	132.8	47.9	33.3	278.2	3.30	330.0	136.8
42.7	28.0	271.2	2.94	294.5	132.9	48.0	33.3	278.4	3.31	330.9	136.9
42.8	28.1	271.4	2.95	295.4	133.0	48.1	33.4	278.6	3.32	331.9	137.0
43.0	28.3	271.6	2.96	296.2	133.1	48.3	33.6	278.8	3.33	332.8	137.1
43.1	28.4	271.8	2.97	297.1	133.2	48.4	33.7	279.0	3.34	333.8	137.2
43.2	28.5	271.9	2.98	297.9	133.3	48.5	33.8	279.1	3.35	334.7	137.3
43.3	28.6	272.1	2.99	298.8	133.4	48.7	34.0	279.3	3.36	335.6	137.4
43.5	28.8	272.3	3.00	299.7	133.5	48.8	34.1	279.5	3.37	336.6	137.5
43.6	28.9	272.5	3.01	300.6	133.6	49.0	34.3	279.7	3.38	337.5	137.6
43.7	29.0	272.7	3.01	301.5	133.7	49.1	34.4	279.9	3.38	338.5	137.7
43.9	29.2	272.8	3.02	302.4	133.8	49.2	34.5	280.0	3.39	339.4	137.8
44.0	29.3	273.0	3.03	303.3	133.9	49.4	34.7	280.2	3.40	340.4	137.9
44.1	29.4	273.2	3.04	304.2	134.0	49.5	34.8	280.4	3.41	341.4	138.0
44.2	29.5	273.4	3.05	305.1	134.1	49.7	35.0	280.6	3.42	342.4	138.1
44.4	29.7	273.6	3.06	306.0	134.2	49.8	35.1	280.8	3.43	343.4	138.2
44.5	29.8	273.7	3.07	306.9	134.3	49.9	35.2	280.9	3.44	344.4	138.3
44.6	29.9	273.9	3.08	307.8	134.4	50.1	35.4	281.1	3.45	345.4	138.4
44.8	30.1	274.1	3.09	308.7	134.5	50.2	35.5	281.3	3.46	346.4	138.5
44.9	30.2	274.3	310	309.6	134.6	50.4	35.7	281.5	3.47	347.4	138.6
45.0	30.3	274.5	3.10	310.5	134.7	50.6	35.9	281.7	3.48	348.4	138.7
45.2	30.5	274.6	3.11	311.4	134.8	50.7	36.0	281.8	3.49	349.4	138.8
45.3	30.6	274.8	3.12	312.3	134.9	50.8	36.1	282.0	3.50	350.4	138.9
45.4	30.7	275.0	3.13	313.2	135.0	51.0	36.3	282.2	3.51	351.4	139.0
45.6	31.1	275.2	3.14	314.1	135.1	51.1	36.4	282.4	3.52	352.4	139.1

Legend:
psia ─ absolute pressure in psi
Psig ─ gauge pressure in psi
kPa ─ absolute pressure in kilo-Pascal
InHg ─ pressure (vacuum) in inch-Mercury

DRAWING OF ELECTRICAL SYSTEM OF TABLE AUTOCLAVE MODELS 1730M, MK

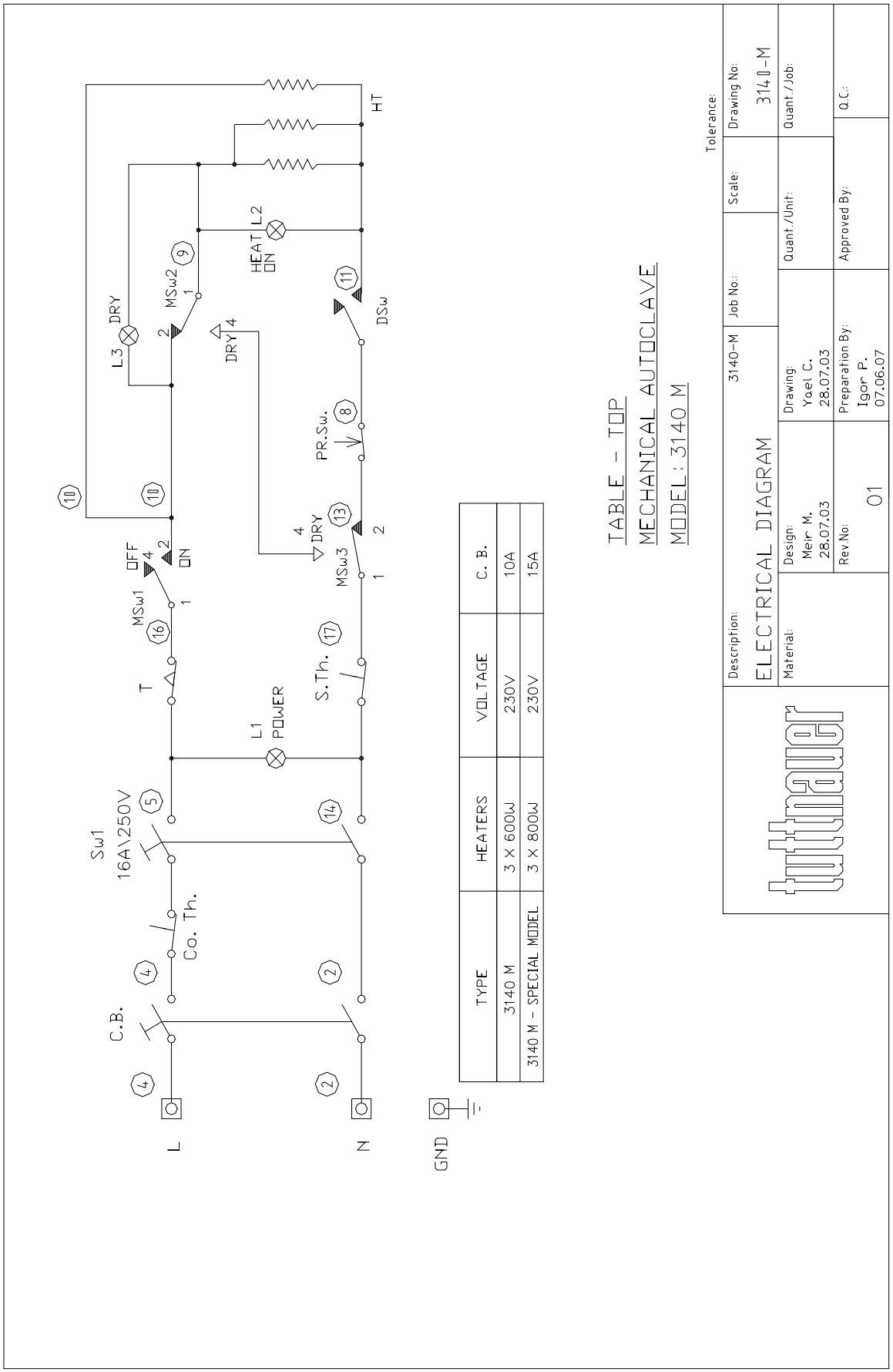


DRAWING OF ELECTRICAL SYSTEM OF TABLE AUTOCLAVE MODELS 2340/2540 M, MK

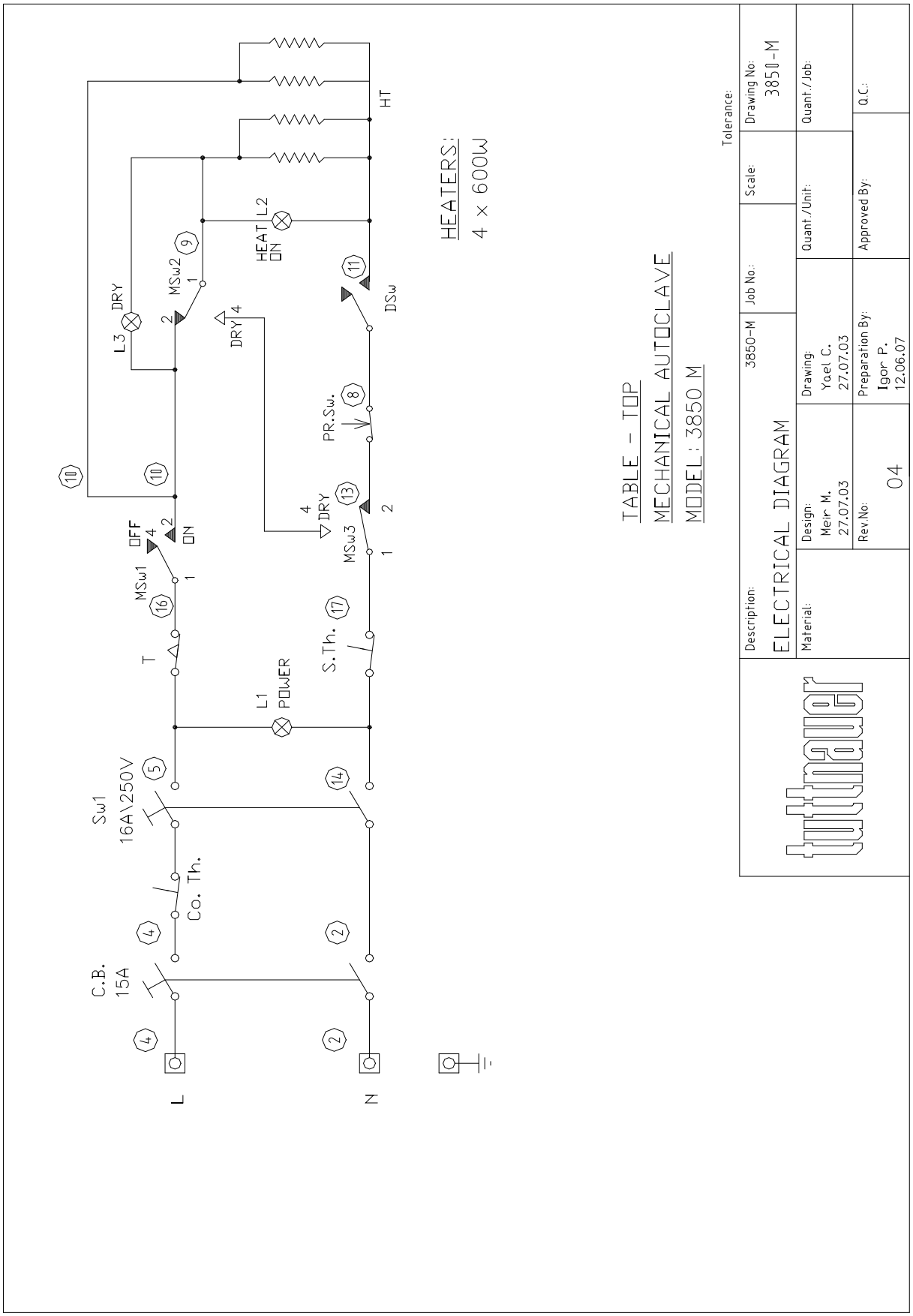


TYPE	HEATERS	VOLTAGE	C. B.
2340 M	4 X 350W	230/120V	10/15A
2540 M	4 X 350W	230/120V	10/15A
2340 MK	4 X 550W	230V	15A
2540 MK	4 X 550W	230V	15A

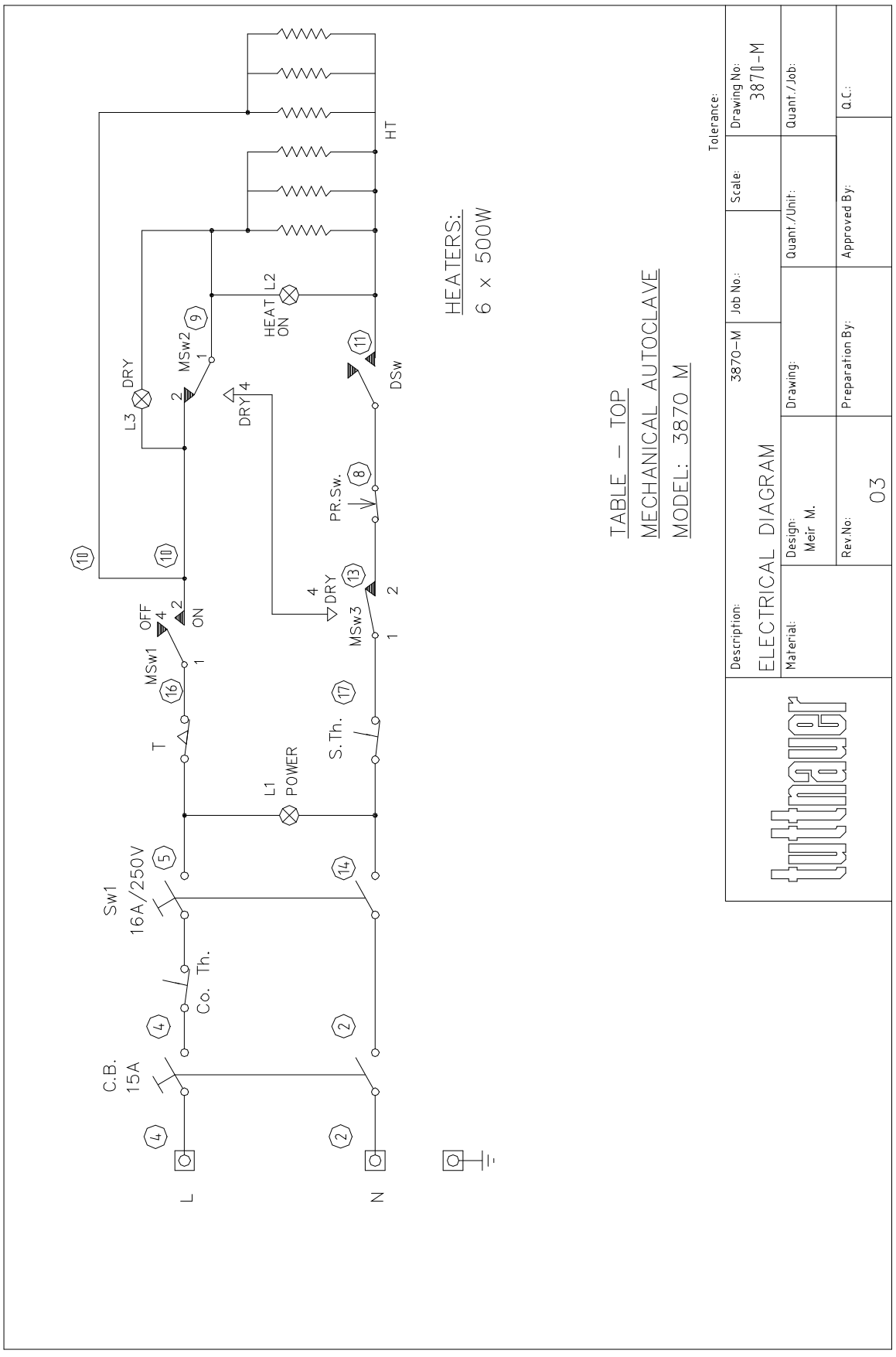
DRAWING OF ELECTRIC SYSTEM OF TABLE AUTOCLAVE MODEL 3140 M



DRAWING OF ELECTRIC SYSTEM OF TABLE AUTOCLAVE MODELS 3850 M



DRAWING OF ELECTRICAL SYSTEM OF TABLE AUTOCLAVE MODELS 3870 M



PIPING DIAGRAM TABLE TOP AUTOCLAVE MODELS: M AND MK