

TECHNICIAN MANUAL

Electronic Table - top Autoclaves with Pre-Vacuum
Models: 2840 ELPV-D

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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. SYMBOL DESCRIPTION



Caution! Consult accompanying documents



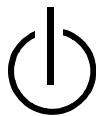
Caution! Hot surface.



Caution! Hot steam.



Protective earth (Ground)



Stand by

3. **INSTALLATION INSTRUCTIONS**

The following utilities have to be connected (Refer to the drawing below 'Rear View' of the autoclave).

- ◆ Power outlet, as detailed in the table below:

Power	1 Ph, 230V/50Hz
Recommended Circuit Breaker	10A

- ◆ The power network must be protected by a current leakage relay.
- ◆ Mineral-free water having a conductibility lower than 15µs (microsiemens), through a 1/2" flexible hose.

To obtain water quality meeting requirements a deionization column or reverse osmosis apparatus can be installed. The water must be delivered at a pressure of 2-3bar. A pressure reducer shall be installed at the water source outlet as instructed below.



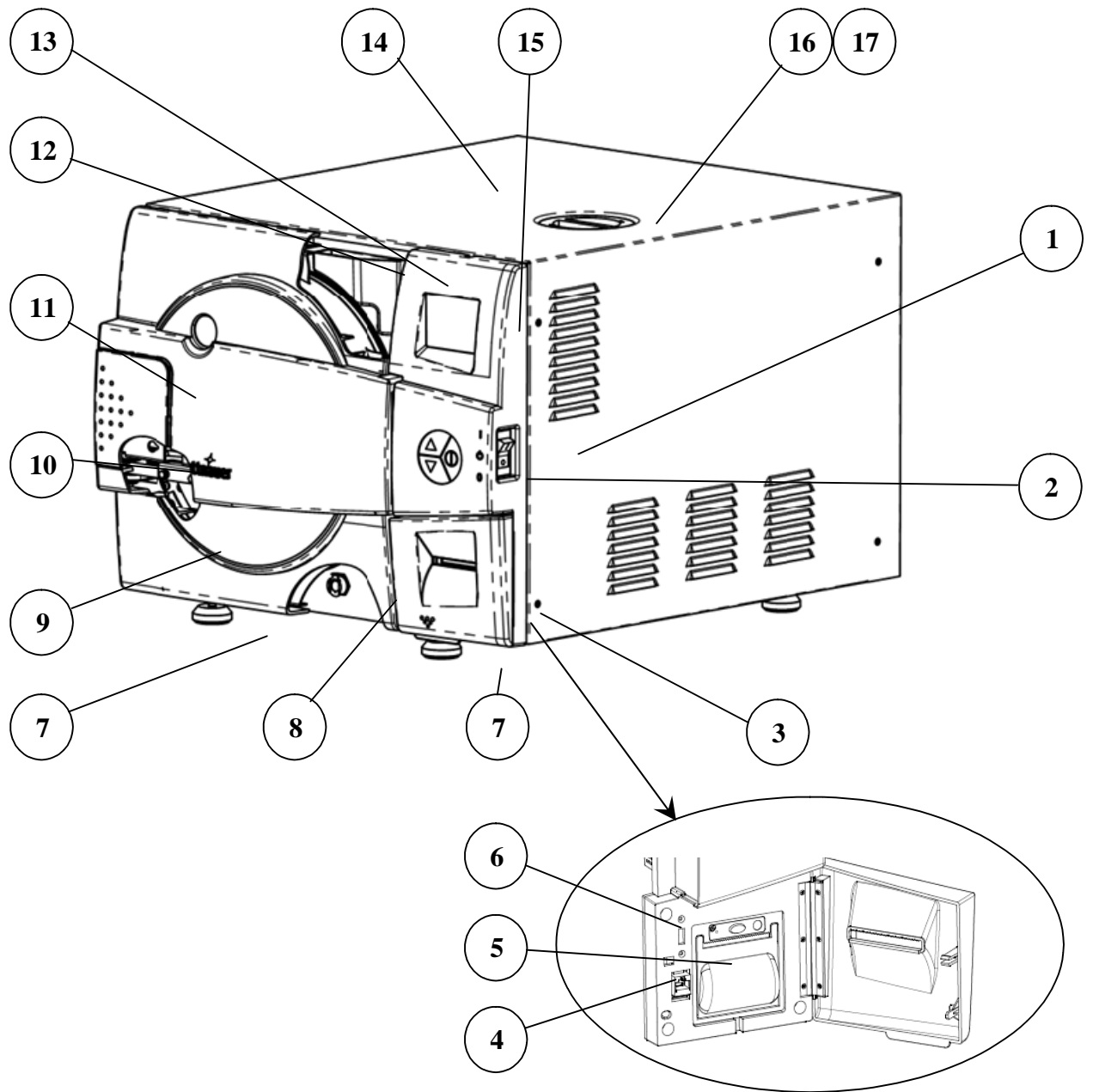
Attention:

Connection of water system to the autoclave must be performed through "BACK FLOW PREVENTION SYSTEM" installation as per EN 1717.

3.1 Installation Site

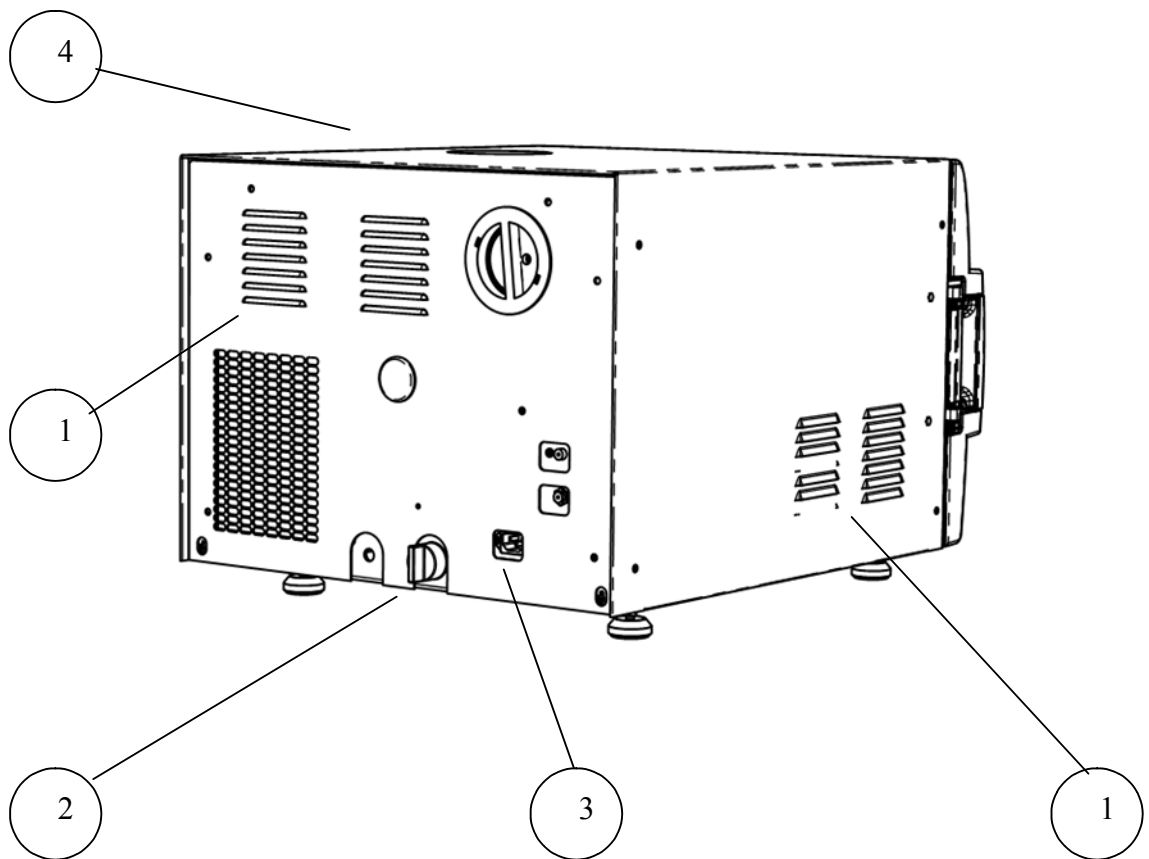
1. Install the autoclave according to the following guidelines:
2. Place the autoclave on the floor. Verify that the surface is leveled.
3. All utility supplies must be prepared in accordance with requirements, before autoclave installation e.g. mineral-free and tap water, compressed air, one-phase power network, connection to the drain of the building.
4. Leave the space free around the autoclave for maintenance and service requirements.

FRONT VIEW



No.	Description	No.	Description
1	Main switch circuit breaker	9	Door cover
2	Operating keyboard	10	Door switch
3	Printer cover	11	Door closing device
4	RJ 45 connection	12	Water reservoir funnel
5	Printer (option)	13	Water level gauge
6	USB connection	14	Autoclave cover
7	Legs	15	Display
8	Mineral-free water reservoir drain valve	16	Mineral-free water reservoir cover
		17	Safety valve

REAR VIEW



No.	Description
1	Ventilation grills
2	Drain line water strainer
3	Main power electric cable socket
4	Mineral-free water reservoir cover

4. TESTS

4.1 Installation Tests



The service technician shall perform the following preliminary checks before operating the autoclave:

a. Integrity Check

Perform a visual check to verify that there are no dents, scratches, broken gauges, etc.

b. Leveling Check

Check that the autoclave is leveled.

c. Leakage current test

Check the precise operation of the earth leakage relay.

d. Continuity Check

Check the continuity of the grounding connection.

At this stage operate the autoclave and continue with the tests:

e. Safety Check

Check the safety elements; safety valve and the door locking mechanisms.

f. Programs Check

Run basic programs of the autoclave and check the operation sequences, the sterilization parameters etc.

g. Validation

Validate the sterilization cycles, taking in consideration the interface of packaging/goods/autoclave.

After the above steps are performed, the autoclave is ready for operation.

4.2 Periodical Tests

PERIOD	TEST
2 months	Test the safety valve by operating it.
6 months	Remove the cover of the autoclave, tighten the screws of the heaters and the electrical connections at the heaters, valves and connectors in the control box.
Year	Check the continuity of the grounding connections.
	Check the temperature and pressure calibration.
	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, safety and cut-off thermostats door locking mechanisms.
	Run basic programs of the autoclave and check the operation sequences, the sterilization parameters etc.
	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 in the control box, heaters and valves and instrumentation.
	Observe the closing device for excessive wear
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!

5. WATER QUALITY

5.1 Water for Generating Steam

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

**Physical Characteristics and Maximum acceptable contaminants levels in steam for sterilizers
(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 ₂ O 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:

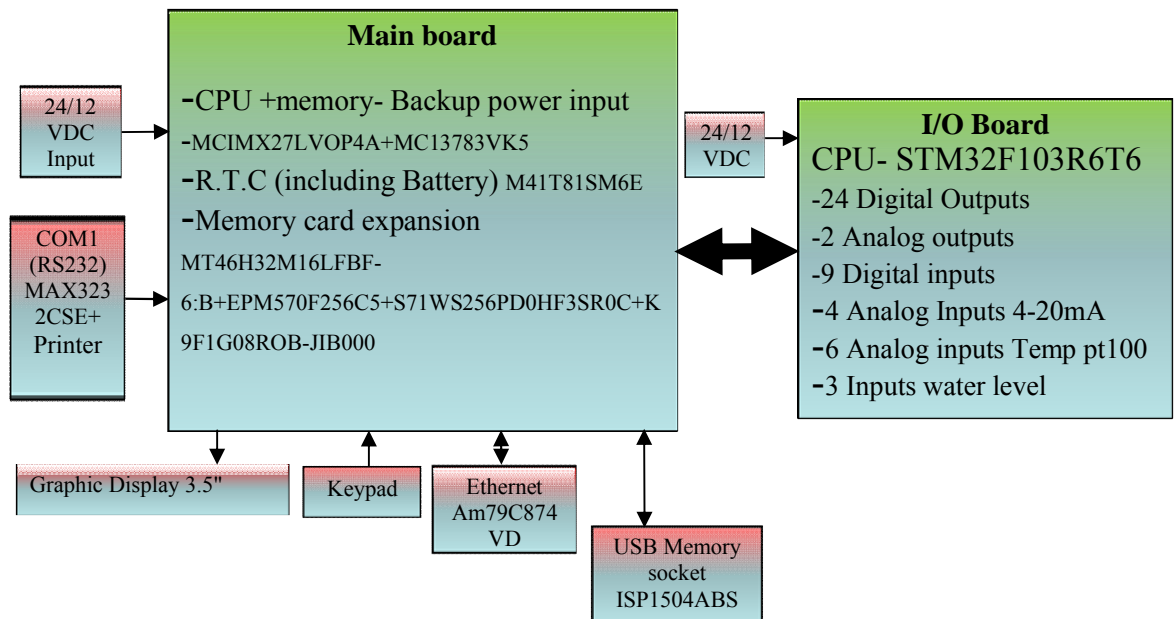
We recommend testing the water quality once a month. The use of water that do not comply with the table above may have severe impact on the working life of the sterilizer and can invalidate the manufacturer's guarantee.

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.

6. DESCRIPTION OF THE CONTROL SYSTEM.

BLOCK DIAGRAM HARDWARE SOFTWARE COMPONENTS



6.1 Application system architecture

The system is divided into three main sections (dll)

1. GUI – holds all the Human Machine interface including the main application screen and all the configuration screens which enable the user to handle the machine.
2. Logic – holds all the application logic for running the machine.
3. Utilities – Holds general functionality which is used by the logic section and the GUI section e.g: converting function for displaying different pressure or temperature units type, languages etc..



Mapping of the software to the hardware – see Software Development Plan
The Hardware architecture is based on Freescale i.MX27 PDK Evaluation Board.

6.2 Description of the programmable component:

6.2.1 Interfaces to users

- **Keypad:** The keypad has three push buttons:
- Down key
 - Up key
 - Start/stop key



- **Display:** The control system has a graphical display
- **USB socket:** The USB socket is intended to load cycles' history from flash a memory (disk on key). The received file is in txt format that can be loaded onto a PC.

6.2.2 Inputs and Outputs

6.2.2.1 Analog inputs

Analog inputs	Description	JP
PT100-1	PT-100 Chamber Temperature	J2
PT100-2	PT-100 Ref Temperature1	J3
Pressure 1	4-20mA chamber pressure control	J7/1
Electrode 1	Water level chamber control 1	J11/1
Electrode 2	Mineral free water level	J11/2

6.2.2.2 Digital inputs

Digital Inputs	Description	JP
Door closed	Indicate door closed	J12/1

6.2.2.3 Digital outputs

Digital Outputs	Description	JP
Unlock door	Operates the door locking solenoid	J13/4
Chamber heat	SSR that operates the chamber heaters	J13/6
Water pump valve	Relay that operates the water pump/ water valve	J13/10
Vacuum pump	Relay that operates the vacuum pump	J13/12
Atmospheric air valve	Atmospheric air valve	J14/2
Slow Exhaust	Slow exhaust valve	J14/6
Fast Exhaust	Fast exhaust valve	J14/8
Vacuum valve	Option, vacuum valve for pre vacuum option	J14/10
Air to Vacuum Pump	Opens <i>Air to Vacuum Pump</i> valve	J14/12

6.2.3 Actuators

The control system operates electrical valves (solenoids), Electric cylinder motors, pneumatic cylinders, electric pumps, heaters.

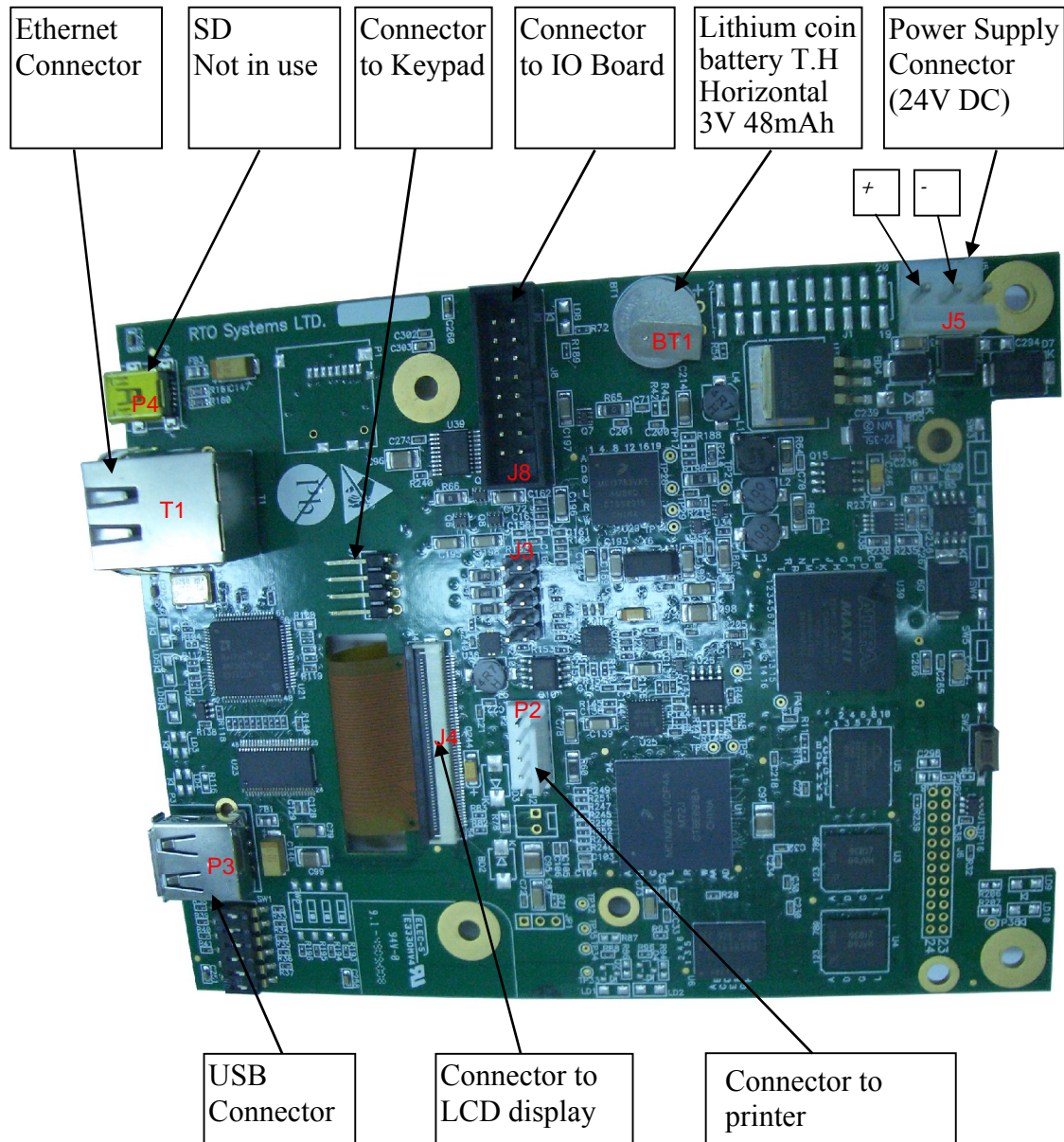
6.2.4 On / off switch

A Rocker Switch 250V AC, 16A

6.3 Software development plan:

The hardware is consisted of cards: MAIN and IO

6.3.1 Main card



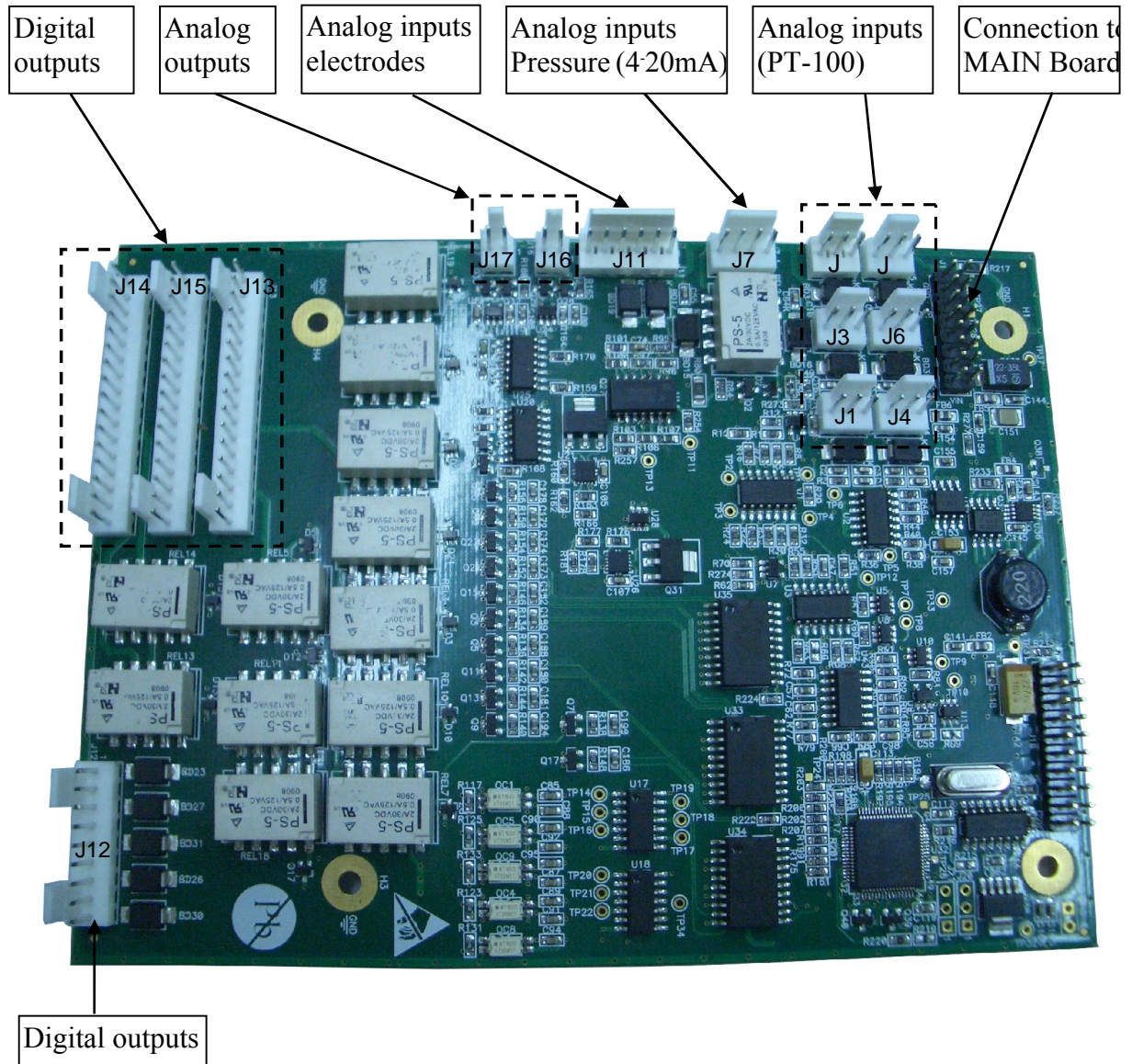
— Operating system (MAIN card)

The Operating system is Microsoft Windows CE version 6. The code to the Operating system is supplied by Microsoft. The connection code between the Operating system and the hardware components (BST – Board Support Package) is supplied by FreeScale. Minimum suitability for this "Tuttnauer" project is performed in this code.

— Development tools (MAIN card)

The software develop environment is on Microsoft Visual Studio 2005 that includes the Microsoft Platform Builder for Windows CE 6.0. The specific Tuttnauer system application is written in C Sharp.net on Microsoft Compact Framework .net

6.3.2 IO Card



IO card is an independent card. It checks the card by a method of a continuous scan of all the ports, saving the data in the memory and transporting this data according to the request in the communication channel RS-232 to the personally adapted protocol.

At the end of the check process of the digital and analog ports, the communication channel is checked, in case of receiving a request, the request is checked and if the request is legitimate it will be taken care of.

The IO card is controlled by the MAIN card. Only when requests are received from the MAIN, the requests will be checked and performed.

The IO card will perform an electrical restart of the systems (IO card) if it does not receive requests within 5 seconds. In the next request received from the MAIN, the IO card will indicate to the requester of IO card systems restart.

The "brain" in the IO card runs on microcontroller type: STM32F103R6T6.

The Microcontroller is an electrical Integrated circuit with an actualized complete system (SoC) including a processing unit, external interfaces, memory, etc.

The Microcontroller is constructed of a number of main components:

1. Central processing unit – the main component in the microcontroller is a central processing unit (CPU) This unit is in charge of receiving the request (command) code from the memory, deciphering, receiving variable data from the memories and performing the command.
2. Memory – divided into 2 sections.
 - 2.1 software memory – in this memory the software that samples the IO card and request (command) from the user are saved. As this memory is a flash memory it is possible to burn the code many times (efficient to the development stage).
 - 2.2 information memory – in this memory the data and other variables values are saved. This memory is not flash memory, but is RAM memory.
 - Digital / Analog ports (in/out) – through them the microcontroller can receive data of digital/analog signs from the system, save them and pass them on respectively to the user request.
 - Ports (in / out) to the communication – in the IO card there is a UART component. This component enables communication with the MAIN card through the RS-232 in suitable protocol.

6.3.3 MAIN and IO cards :communication protocol between IO board to Main Board

Communication protocol between IO to Main boards is described below.

The communication managed by the Main board (master), the IO functions as slave

1. There are six communication functions.

The communication functions (to read or write) identified by number.

The communication functions listed below:

- 1.1 01 - Read – command to IO send all the information of digital analog inputs.
- 1.2 02 - Write – Command to IO to activate analog and digital outputs.
- 1.3 03 - Read version – IO software version to verify the version.
- 1.4 04 – N.A.
- 1.5 05 - Read number that identifies the ID of IO board and the software version.
- 1.6 06 - Write (only at the first time) to IO his ID and software number.
2. First Byte (Byte 1).

The first byte identifies ID functionality request. It can be one of the numbers in a paragraph.
3. The second byte will present the data size if the main board asks to write information to the IO. If the request is to read this byte will be 00.
4. The number of the request. This number is increased from 00-ff.
5. Check sum of the package – to prevent mail functionality of the board if there is interference in communication.
6. The information package transfer. The information contains number of the input or output and data for/from each I/O.

Bytes identify number of input or output followed by two bytes containing the data of the input or outputs.
7. Last byte contains a check sum of the entire package that is transferred. This is to verify that the information is not corrupted.

Example

The main board sends:

01;00;0003;0004;

01 Ask to Read inputs.

00 not transfer information.

0003 Request number 3

0004 Checksum to verify the request

7. **CHECKING AND CHANGING PARAMETERS AND OTHER DATA**

The control system prevents changing programs if the door is closed. This protection is intended to avoid program changes if the autoclave is loaded. If the operator for example inserts the load into the chamber, closes the door and leaves the room and another operator/user tries to change the program, the operator/user will not be able to do this unless the door is opened and the load inside the chamber can be seen.

7.1 **Directories and subdirectories**

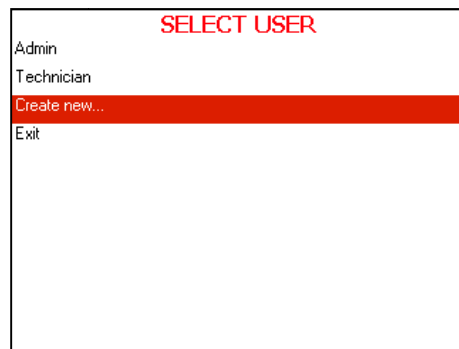
The Technician may perform the following:

DIRECTORY	SUBDIRECTORY	SECOND SUBDIRECTORY
Cycle Parameters – applicable only for Custom 1 and Custom 2 programs	See sec. 7.3 Cycle Parameters (Custom)/ Duplicating a Cycle	
System Parameters	Print Rate All	
	Print Rate Sterilization	
	Screen Saver	
Inputs / Outputs	View digital inputs state	
	View digital outputs state	
	Test digital outputs	
	View analog inputs state	
	Analog inputs calibration	
History	View old cycle history	Last 10 cycles
		Last 50 cycles
		All cycles history
	Export history to USB	
Maintenance	Clear history files	
	Set date and time	
	Export gain offset to USB	
	Import gain and offset from USB	
	Reset cycles number	
	Reset atmospheric pressure	
	Test RTC	
	Printer test	
Advanced options	Print all gain and offset	
	Start cycle by clock	
	Enable cycles	
	Set language	
	Set temperature units	
	Set pressure units	
	Export all settings to USB device	
	Import all settings from USB device	
	Return to factory default settings	
	Set current settings as factory default	
	Duplicate cycle	
	Delete custom cycles	
	Set mac address	
	Set Master IP address	

Version information	View current version information	
	View factory default version information	
	View previous version information	
	Return to factory default version	
	Return to previous version	
	Import application from USB	
	Import application and settings from USB	
	Export current version to USB	

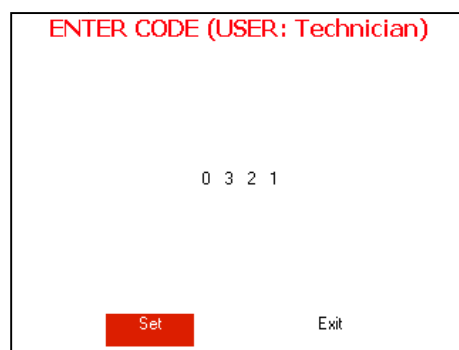
7.2 *Entering the main menu*

1. Enter the **SELECT USER** screen by pressing the **UP** and **DOWN** keys simultaneously.
To exit the **SELECT USER** screen move the cursor to **Exit** by pressing **UP** or **DOWN** keys and then press **START/STOP** key.



SELECT USER screen will be displayed.

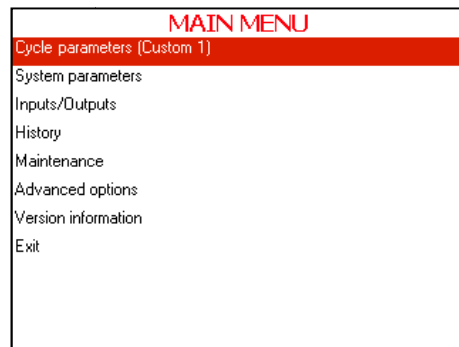
2. Move the cursor to **Admin** and press **START/STOP** key. The following



screen will be displayed:

3. 0000 is displayed on the screen with the cursor blinking on the right digit.
4. To increase or decrease the digits, press the **UP** or **DOWN** keys.
5. After changing the code to 0321 move the cursor to **Set** by pressing the **START/STOP** key.
6. When **Set** is blinking, press the **UP** or **DOWN** keys to enter the **MAIN MENU** of the autoclave.

The following screen will be displayed:



In order to exit the **ENTER CODE** screen move the cursor to **Exit** by pressing **START/STOP** Key. when **Exit** is blinking press **UP** or **DOWN** keys.

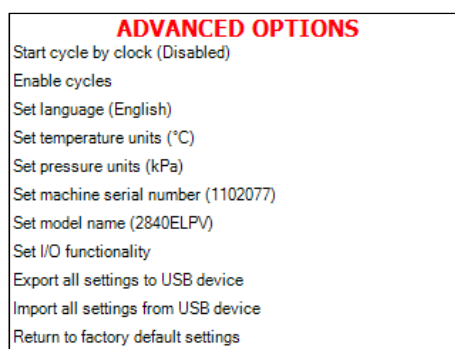
7. To browse through the directories, use the **UP** or **DOWN** keys.
8. When the required directory is blinking, press the **START/STOP** key. The required screen will be displayed.
9. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.3 *Cycle Parameters (Custom)/ Duplicating a Cycle*

This directory is applicable only for custom programs.

The control system prevents changing cycle parameters for the existing programs. To create your own custom program with the desired parameters, you need to duplicate a cycle as follows:

1. Enter the main menu as described above.
2. On the Main Menu, choose Advanced Options.



3. Scroll down to see Duplicate Cycle, choose it by pressing Up/Down.

ADVANCED OPTIONS

Set I/O functionality
Export all settings to USB device
Import all settings from USB device
Return to factory default settings
Set current settings as factory default
Duplicate cycle
Delete custom cycles
Set mac address (58.1F.EF.10.D0.FD)
Set Master IP address (102.0.0.1)
Setup machine
Exit

- Select the cycle you want to duplicate, then press Start/Stop.

SELECT CYCLE

☒ Unwrapped instruments
☐ Unwrapped pouches
☐ Unwrapped delicate instruments
☐ Wrapped delicate instruments
☐ Liquid A
☐ Liquid B
☒ Vacuum Test
☐ G
Exit

- Give a name to your new cycle.

ADD NEW CYCLE

Set
Exit

The Cycle Parameters directory includes seven subdirectories
These subdirectories enable to see and change the cycle parameters.

Subdirectory	Property
Create Pulse	Pulse A Count
	Pulse A Stay Time
	Pulse A Low Pressure
	Pulse A High Pressure
Heating	Sterilization Temperature
Sterilization	Sterilization Temperature
	Sterilization Time
Exhaust	Exhaust Mode
Drying	Dry Time
	Dry Air on Pressure
	Dry Air Off Pressure

	Dry Heat On 1
	Dry Heat Off 1
	Dry First Stage Time
	Dry Heat On 2
	Dry Heat Off 2
Ending	End Temperature
	Exhaust Mode
Global	F0 Mode
	Multiple Cycles
	Multiple Cycle Gap

Note: To change the cycle parameters, you must first choose the required cycle, and then enter the Main Menu.

For seeing or changing the parameters proceed as follows:

Choose and enter Cycle Parameters.

The following screen will display:

Custom 1	
Create Pulse	
Heat	
Sterilization	
Cooling	
Exhaust	
Dry	
End	
Exit	

7.3.1 Create Pulse

7.3.1.1 Pulse A Count

Custom 1	
Pulse A Count	3
Pulse A Stay Time	10 sec
Pulse A Low Pressure	130.0 kPa
Pulse A High Pressure	180.0 kPa
Pulse B Count	0
Pulse B Stay Time	2 sec
Pulse B Low Pressure	160.0 kPa
Pulse B High Pressure	180.0 kPa
Exit	

SET PARAMETER	
Max:	10
Min:	0
Default:	3
Pulse A Count	0 0 0 0 3
Set	Exit

Typical display for **Create Pulse** subdirectory

1. Choose and enter Pulse A Count.
2. SET PARAMETER screen will be displayed.
3. Set the required value, move to Set and press UP or DOWN keys to confirm the parameter value.
4. In order to exit move the cursor to Exit and press UP or DOWN keys.
5. Repeat the same action for all the other parameters shown on the above screen.

7.3.2 Heating

7.3.2.1 Sterilization Temperature

Custom 1	
Sterilization Temperature	134.0 °C
Exit	

SET PARAMETER	
Max:	136.0 °C
Min:	130.0 °C
Default:	134.0 °C
Sterilization Temperature	
0 0 1 3 4 °C	
Set	Exit

Typical display for **Sterilization Temperature** subdirectory

Choose and enter **Sterilization Temperature**

SET PARAMETER screen will be displayed

Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.

In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

7.3.3 Sterilization

7.3.3.1 Sterilization Temperature

See 7.4.2.1 Sterilization Temperature

Repeat the same action for all the other parameters shown on the above screen.

7.3.4 Exhaust

Exhaust Mode

Custom 1	
Exhaust Mode	1
Exit	

SET PARAMETER	
Max:	2
Min:	1
Default:	1
Exhaust Mode	
0 0 0 0 1	
Set	Exit

Typical display for **Exhaust Mode** subdirectory

1. Choose and enter Exhaust Mode
2. SET PARAMETER screen will be displayed
3. Set the required value, move to Set and press UP or DOWN keys to confirm the parameter value.
4. In order to exit move the cursor to Exit and press UP or DOWN keys.

7.3.5 Dry

7.3.5.1 Dry Heat On 1

Custom 1	
Dry Heat On 1	4 sec
Dry Heat Off 1	12 sec
Dry First Stage Time	5 min
Dry Heat On 2	2 sec
Dry Heat Off 2	20 sec
Exit	

SET PARAMETER	
Max:	120 sec
Min:	0 sec
Default:	4 sec
Dry Heat On 1	
0 0 0 0 4 sec	
Set	Exit

Typical display for **Dry Heat On 1** subdirectory

1. Choose and enter Dry Heat On 1
2. SET PARAMETER screen will be displayed
3. Set the required value, move to Set and press UP or DOWN keys to confirm the parameter value.
4. In order to exit move the cursor to Exit and press UP or DOWN keys.
5. Repeat the same action for all the other parameters shown on the above screen.

7.3.6 Ending

7.3.6.1 End Temperature

Custom 1	
End Temperature	120.0 °C
Multiple Cycles	1
Multiple Cycles Gap	2 min
Exit	

SET PARAMETER	
Max:	120 sec
Min:	0 sec
Default:	4 sec
Dry Heat On 1	
0 0 0 0 4 sec	
Set	Exit

Typical display for **End Temperature** subdirectory

1. Choose and enter End Temperature
2. SET PARAMETER screen will be displayed
3. Set the required value, move to Set and press UP or DOWN keys to confirm the parameter value.
4. In order to exit move the cursor to Exit and press UP or DOWN keys.
5. Repeat the same action for all the other parameters shown on the above screen.

7.3.7 System Parameters

This directory includes three subdirectories

The following screen will be displayed when entering **SYSTEM PARAMETERS** directory:

SYSTEM PARAMETERS	
Print Rate All	3 min
Print Rate Sterilization	1 min
Screen Saver	90 min
Exit	

1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.3.8 Print Rate All

This subdirectory enables to change the printing rate during the whole cycle except sterilization stage

SET PARAMETER	
Max:	30 min
Min:	1 min
Default:	3 min
Print Rate All	
	0 0 0 0 3 min
Set	Exit

1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP** key.
3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the **UP** and **DOWN** keys simultaneously.

7.3.9 *Print Rate Sterilization*

This subdirectory enables to change the printing rate during sterilization stage

SET PARAMETER

Max: 30 min
Min: 1 min
Default: 1 min

Print Rate Sterilization

0 0 0 0 1 min

Set Exit

1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP**.
3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the **UP** and **DOWN** keys simultaneously.

7.3.10 *Screen Saver*

This subdirectory enables the operator to set the screen saver time. The default time value is 90 minutes. It is possible to increase or decrease the time value up to a maximum of 600 minutes or down to a minimum 0 minutes.

SET PARAMETER

Max: 600 min
Min: 0 min
Default: 90 min

Screen Saver

0 0 9 0 min

Set Exit

When entering the **Screen Saver** screen, the time will be displayed. The cursor is blinking on the "minute" digit. The time is displayed in the form "0000" min.

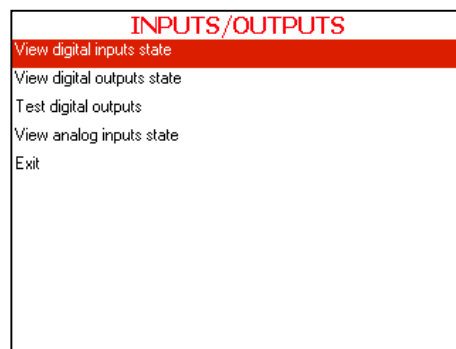
1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP**.

3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to Exit with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the **UP** and **DOWN** keys simultaneously.

7.4 *Inputs/Outputs*

This directory includes four subdirectories

The following screen will be displayed when entering **INPUTS/OUTPUTS** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.4.1 View digital inputs state

VIEW DIGITAL INPUTS STATE	
<input type="checkbox"/>	Door Closed (J1:1)
<input checked="" type="checkbox"/>	Supply Water Indicator (J1:2)
<input checked="" type="checkbox"/>	Supply Distilled Water Indicator (J1:3)
<input checked="" type="checkbox"/>	Compressed Air Indicator (J1:4)
<input checked="" type="checkbox"/>	Door Unlocked (J1:6)
<input type="checkbox"/>	Door Locked (J1:8)
Exit	

1. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the UP and DOWN keys simultaneously.

7.4.2 View digital outputs state

VIEW DIGITAL OUTPUTS STATE	
<input checked="" type="checkbox"/>	Buzzer (J13:1,2)
<input type="checkbox"/>	Chamber Heat (J13:5,6)
<input type="checkbox"/>	Water Pump Valve (J13:9,10)
<input type="checkbox"/>	Compressed Air To Chamber (J14:3,4)
<input type="checkbox"/>	Slow Exhaust (J14:5,6)
<input type="checkbox"/>	Fast Exhaust (J14:7,8)
<input type="checkbox"/>	Atmospheric Air Valve (J14:9,10)
<input type="checkbox"/>	Cool Drain (J14:11,12)
<input type="checkbox"/>	Cooling Water (J14:15,16)
<input type="checkbox"/>	Compressed Air To Jacket (J15:1,2)
<input type="checkbox"/>	Close Door (J15:3,4)

VIEW DIGITAL OUTPUTS STATE	
<input type="checkbox"/>	Water Pump Valve (J13:9,10)
<input type="checkbox"/>	Compressed Air To Chamber (J14:3,4)
<input type="checkbox"/>	Slow Exhaust (J14:5,6)
<input checked="" type="checkbox"/>	Fast Exhaust (J14:7,8)
<input type="checkbox"/>	Atmospheric Air Valve (J14:9,10)
<input type="checkbox"/>	Cool Drain (J14:11,12)
<input type="checkbox"/>	Cooling Water (J14:15,16)
<input type="checkbox"/>	Compressed Air To Jacket (J15:1,2)
<input type="checkbox"/>	Close Door (J15:3,4)
<input type="checkbox"/>	Open Door (J15:5,6)
Exit	

This subdirectory enables to view the digital outputs state

1. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the **UP** and **DOWN** keys simultaneously.

7.4.3 Test digital outputs

TEST DIGITAL OUTPUTS	
<input checked="" type="checkbox"/>	Buzzer (J13:1,2)
<input type="checkbox"/>	Chamber Heat (J13:5,6)
<input type="checkbox"/>	Water Pump Valve (J13:9,10)
<input type="checkbox"/>	Compressed Air To Chamber (J14:3,4)
<input type="checkbox"/>	Slow Exhaust (J14:5,6)
<input type="checkbox"/>	Fast Exhaust (J14:7,8)
<input type="checkbox"/>	Atmospheric Air Valve (J14:9,10)
<input type="checkbox"/>	Cool Drain (J14:11,12)
<input type="checkbox"/>	Cooling Water (J14:15,16)
<input type="checkbox"/>	Compressed Air To Jacket (J15:1,2)
<input type="checkbox"/>	Close Door (J15:3,4)
<input type="checkbox"/>	Open Door (J15:5,6)

TEST DIGITAL OUTPUTS	
<input type="checkbox"/>	Water Pump Valve (J13:9,10)
<input type="checkbox"/>	Compressed Air To Chamber (J14:3,4)
<input type="checkbox"/>	Slow Exhaust (J14:5,6)
<input type="checkbox"/>	Fast Exhaust (J14:7,8)
<input type="checkbox"/>	Atmospheric Air Valve (J14:9,10)
<input type="checkbox"/>	Cool Drain (J14:11,12)
<input type="checkbox"/>	Cooling Water (J14:15,16)
<input type="checkbox"/>	Compressed Air To Jacket (J15:1,2)
<input type="checkbox"/>	Close Door (J15:3,4)
<input type="checkbox"/>	Open Door (J15:5,6)
Exit	

This subdirectory enables to test the digital outputs state

1. In order to test the digital output move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key and verified that the required item operates.
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.4.4 View analog inputs state

VIEW ANALOG INPUTS STATE	
Drain Temperature (J5)	030.0°C (850)
Chamber Temperature (J2)	030.0°C (850)
Ref Temperature 1 (J3)	030.0°C (850)
Chamber Pressure (J7:1)	100.0 kPa (1600)
Chamber Water Level (J11:1)	0
Exit	

This subdirectory enables to view the analog inputs state

1. In order to exit this screen follows one of the next:
 - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
 - Press the **UP** and **DOWN** keys simultaneously.

7.5 History

This directory includes two subdirectories

The following screen will be displayed when entering **HISTORY** directory:

HISTORY OPTIONS	
View old cycle history	
Export history to USB	
Exit	

1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:

- Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously.

7.5.1 View old cycle history

This subdirectory enables to print the 100 previous cycles.

The following screen will be displayed when entering **View old cycle history** subdirectory:

HISTORY	
cycle_000100	31/DEC/2009 11:43:17
cycle_000099	31/DEC/2009 11:43:10
cycle_000098	31/DEC/2009 11:42:47
cycle_000097	31/DEC/2009 11:42:43
cycle_000096	31/DEC/2009 11:42:39
cycle_000095	31/DEC/2009 11:42:35
cycle_000094	31/DEC/2009 11:42:30
cycle_000093	31/DEC/2009 11:42:27
cycle_000092	31/DEC/2009 11:42:22
cycle_000091	31/DEC/2009 11:42:16
cycle_000090	31/DEC/2009 11:42:13

1. Choose the required cycle according to cycle number, date and time with the **UP** or **DOWN** keys
2. Press the **START/STOP** key. The printer will print the printout of the required cycle
3. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.5.2 Export history to USB

This subdirectory enables to Export history to USB device.

1. Insert the USB device into the USB Socket
2. Move the cursor to **Export history to USB**
3. Press the **START/STOP** key.
4. The following screen will be displayed:

HISTORY OPTIONS	
Last 10 cycles	
Last 50 cycles	
All cycles history	
Exit	

5. Move the cursor to the required item and press **START/STOP** key
6. The following screen will be displayed:



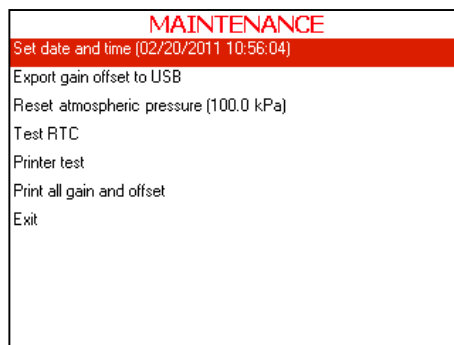
7. Remove the USB device from the USB Socket
8. In order to exit this screen and return to **HISTORY OPTIONS** screen press **START/STOP** key.
9. In order to exit the **HISTORY OPTIONS** screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.6 Maintenance

This directory includes six subdirectories

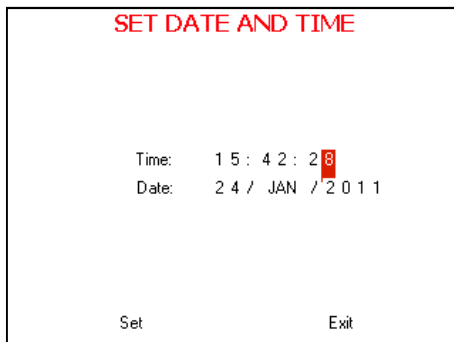
The following screen will be displayed when entering **MAINTENANCE** directory:

1. In order to enter to these subdirectories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.



7.6.1 Set date and time

This subdirectory enables the operator to set the date and time. This **SET DATE AND TIME** screen will be displayed when entering the subdirectory:



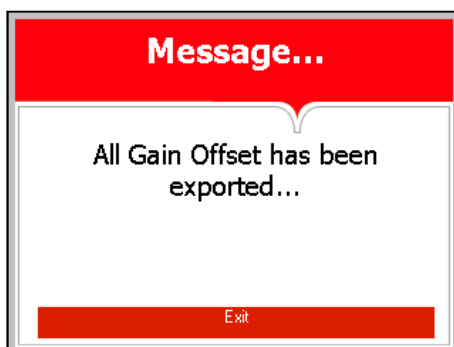
When entering the **SET DATE AND TIME** screen, the time and date are displayed. The cursor is blinking on the "second" digit. The time is displayed in the upper row in the form "HH:MM:SS". The hour range is 24 hour (i.e. from "0" to "24") The date is displayed in the lower row in the form "DD:MMM:YYYY".

1. To increase or decrease the time or the date use the **UP** or **DOWN** keys.
 2. To move the cursor from one digit to another press the **START/STOP** key.
 3. After changing the time and the date move the cursor to **Set**.
 4. Confirm the new time and date by pressing **UP** or **DOWN** keys.
- After saving is completed, **SET DATE AND TIME** screen is still displayed, move the cursor to **Exit** and press **UP** or **DOWN** keys to return to **MAINTENANCE** screen.

7.6.2 Export gain offset to USB

This subdirectory enables to Export gain offset to USB device.

1. Insert the USB device into the USB Socket
2. Move the cursor to **Export gain offset to USB**
3. Press the **START/STOP** key
4. The following screen will be displayed:



5. Remove the USB device from the USB Socket
6. In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.
7. In order to exit the **MAINTENANCE** directory follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.6.3 *Reset atmospheric pressure*

This subdirectory enables to reset the atmospheric pressure.

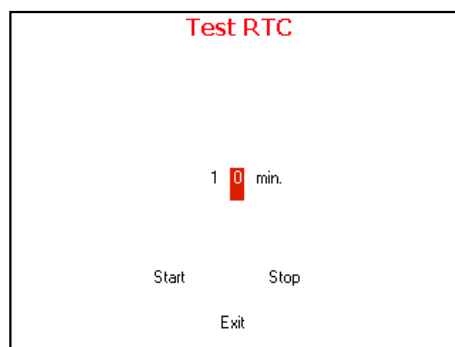


1. In order to exit the **MAINTENANCE** directory follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.6.4 *Test RTC*

This subdirectory enables the operator to test the RTC (Real Time Clock)

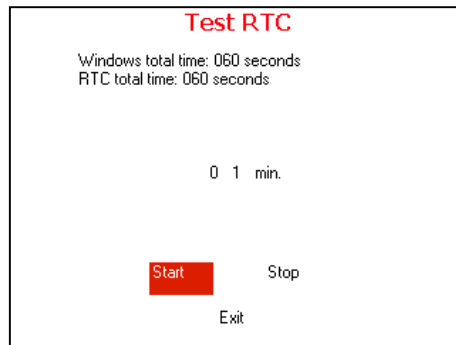
The Test RTC screen is displayed when entering the directory:



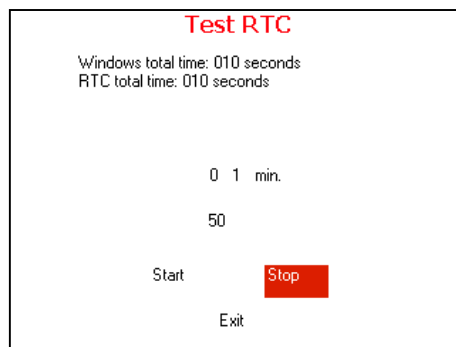
When entering the Test RTC screen, the time is displayed. The cursor is blinking on the right "minute" digit.

The time is displayed in the form "mm".

1. To increase or decrease the time use the **UP** or **DOWN** keys.
2. To move the cursor from one digit to another press the **START/STOP** key.
3. After choosing the required time move the cursor by pressing **START/STOP** key to start and press **UP** or **DOWN** keys
4. The test will start, the following screen is an example to completed test for 1 minute



5. There is an option to stop the test before it is finished by moving the cursor to **Stop** and pressing **UP** or **DOWN** keys. The test will stop at this point and the results will be displayed in the screen.



6. In order to exit this screen move the cursor to **EXIT** by pressing **START/STOP** key and select it by pressing the **UP** or **DOWN** Keys

7.6.5 *Print Test*

This subdirectory enables the operator to test the printer.
When pressing **START/STOP** key on the **Printer Test** item the printer will print out the following print out:

Cycle errors:
None
Canceled By User
Door is open
Analog Input Error
I/O Card Failed
Power Down
Invalid Parameter Value
No Water
Heat Time Error
Vacuum Time Error
Pressure Time Error
Heat Time Error (Keep)
Heat Time Error
Low Pressure
High Pressure
Low Temp
High Temp
Time Error
Low Pressure (Cooling)
High Temp. (Cooling)
High Pressure (Exhaust)
High Pressure (Dry)
High Pressure (Ending)
Air Error
High Temp. (Ending)
Error Open Door
Error Close Door
Accessory Timeout

And the following screen will be displayed.



In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.

In order to exit the **MAINTENANCE** directory follows one of the next:

- Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously

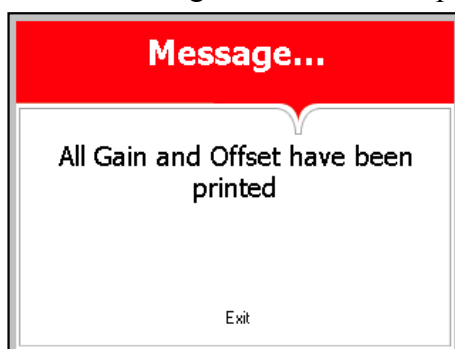
7.6.6 *Print All Gain and Offset*

This subdirectory enables the operator to print all the gain and offset values.

When pressing **START/STOP** key on the **Print all gain and offset** item the printer will print out the following:

Drain Temperature
G:000.0400;O:-004.0000
Chamber Temperature
G:000.0400;O:-004.0000
Ref Temperature 1
G:000.0400;O:-004.0000
Chamber Pressure
G:000.1250;O:-100.0000

And the following screen will be displayed.



In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.

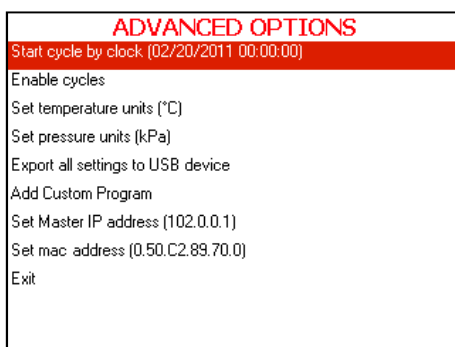
In order to exit the **MAINTENANCE** directory follows one of the next:

- Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously

7.7 *Advanced Options*

This directory includes eight subdirectories

The following screen will be displayed when entering **ADVANCED OPTIONS** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.7.1 *Start cycle by clock*

This subdirectory enables the operator to postpone the operation by a pre-set time.

This **Start cycle by clock** screen will be displayed when entering the **START CYCLE BY CLOCK** subdirectory:

When entering the **START CYCLE BY CLOCK** screen, the time is displayed. The cursor is blinking on the "minute" digit.

The time is displayed in the form "HH:MM". The hour range is 24 hours (i.e. from "0" to "24").

Enabling the START CYCLE BY CLOCK

1. To increase or decrease the time use the **UP** or **DOWN** keys.
2. To move the cursor from one digit to another press the **START/STOP** key.
3. After changing the time move the cursor to **Enabled**
4. Confirm the **START CYCLE BY CLOCK** by pressing **UP** or **DOWN** keys.
5. Move the cursor by pressing **START/STOP** key to **Exit** and press **UP** or **DOWN** keys to return to **ADVANCED OPTIONS** screen.

Canceling the START CYCLE BY CLOCK

1. To cancel the **START CYCLE BY CLOCK** move the cursor by pressing **START/STOP** key to **Disable** and press **UP** or **DOWN** keys.
2. Move the cursor to **EXIT** by pressing **START/STOP** key and press **UP** or **DOWN** keys, the **START CYCLE BY CLOCK** will be canceled.

START CYCLE BY CLOCK

Time: 2 2 : 0 0

☐ Enabled
☒ Disable
 Exit

7.7.2 Enable cycles

ENABLE PROGRAMS

- ☒ Unwrapped instruments
- ☒ Wrapped instruments
- ☒ Unwrapped pouches
- ☒ Wrapped pouches
- ☒ Unwrapped delicate instruments
- ☒ Wrapped delicate instruments
- ☒ Custom 1
- ☒ Custom 2
- ☒ Liquid A
- ☒ Liquid B
- ☐ Pasteurization

This subdirectory enables to enable or disable cycles. In order to enable or disable a cycle move the cursor to the required item and press **START/STOP** key to check or uncheck the required cycle.

1. In order to exit this subdirectory follow one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.7.3 Set Temperature units

SET TEMPERATURE UNITS

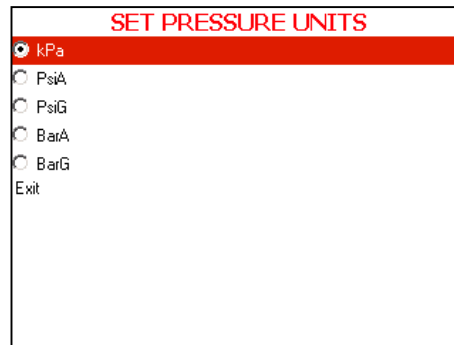
☒ Celsius
☐ Fahrenheit
 Exit

This subdirectory enables to change the temperature units from Celsius to Fahrenheit and vice versa.

In order to change the temperature units move the cursor to the required item and press **START/STOP** key.

1. In order to exit this subdirectory follow one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.7.4 Set pressure units

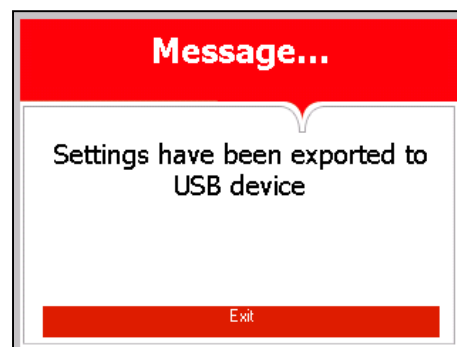


This subdirectory enables to change the pressure units

In order to change the pressure units move the cursor to the required item and press **START/STOP** key.

1. In order to exit this subdirectory follow one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.7.5 Export all settings to USB device



1. This subdirectory enables to export all settings to USB device
2. Insert the USB device into the USB socket.
3. Press **START/STOP** key on the **Export all settings to USB device** item.
4. In order to exit this subdirectory, press the **START/STOP** key.

7.7.6 Set Master IP address (102.0.0.1)

SET IP ADDRESS

1 0 2 . 0 0 0 . 0 0 0 . 0 0 1

Set Exit

This subdirectory enables to change the IP address in order to enable connection to the device via remote control.

7.7.7 Set mac address (0.50.C2.89.70.0)

SET MAC ADDRESS

0 0 . 5 0 . C 2 . 8 9 . 7 0 . 0 0

Set Exit

This subdirectory enables to change the mac address in order to connect an additional device and connect both of them (or even more) via remote control.

7.8 Version information

This directory includes two subdirectories

The following screen will be displayed when entering **VERSION INFORMATION** directory:

VERSION HANDLING

View current version information

View factory default version information

View previous version information

Exit

1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key

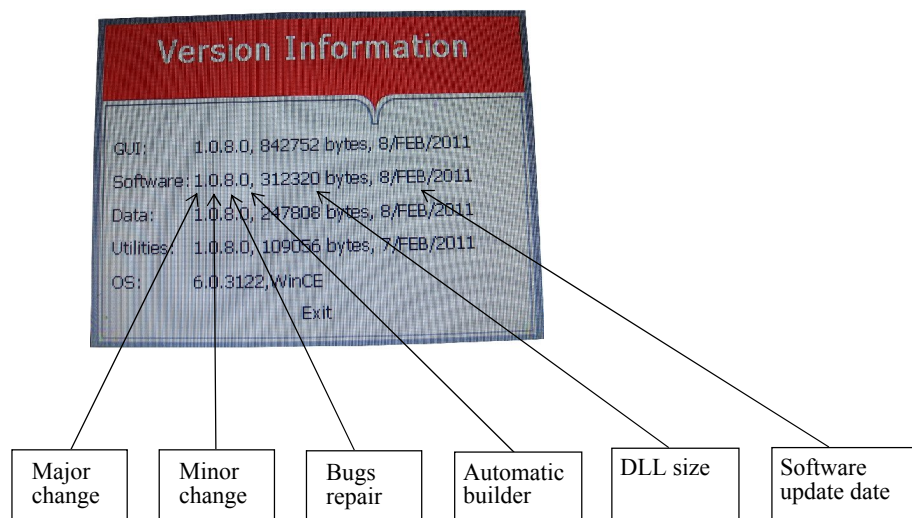
2. In order to exit this screen follows one of the next:
 - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
 - Press the **UP** and **DOWN** keys simultaneously.

7.8.1 View current version information

In order to view this subdirectory press **START/STOP** key on the **View current version information** item.

This subdirectory enables the operator to see the current version information as described below:

1. GUI Graphic user interface – Holds the entire Human Machine interface including the main application screen and all the configuration screens, which enables the user to handle the machine.
2. Software Logic – Holds all the application logic for running the machine.
3. Data Code section that handle the entire data storage in the application.
4. Utilities – Utilities – Holds general functionality which is used by the logic section and the GUI section e.g.: converting function to display different pressure or temperature units, languages types etc.
5. OS Operational System – Microsoft Windows CE. Version 6.0.



- Major change Concept change eg: changing the operating system, Changed by the in accordance with the change programmer sequence.
- Minor change Feature change or function change, changed by the programmer in accordance with the change sequence.
- Bugs repair Software bugs repair changed by the programmer in accordance with the change sequence.

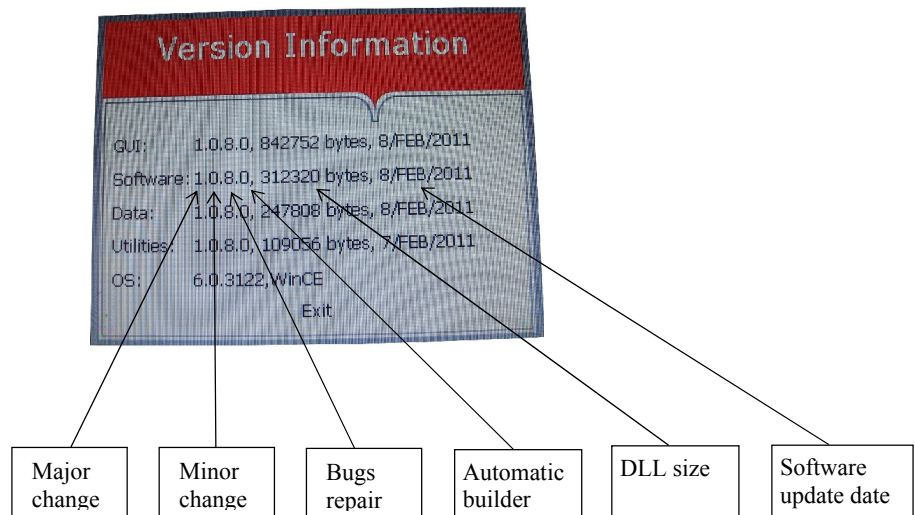
- Automatic builder Changed (updated) automatically after each source code compilation
- DLL size Dynamic-Link Library size

7.8.2 *View factory default version information*

This subdirectory enables the operator to see the factory default version information.

In order to see this subdirectory press **START/STOP** key on the **View factory default version information** item.

The following screen will be displayed:



7.8.3 *View previous version information*

This subdirectory enables the operator to see the previous version information.

In order to see this subdirectory press **START/STOP** key on the **View previous version information** item.

8. *REPLACING ELEMENTS*

8.1 *Replacing the Control Panel*

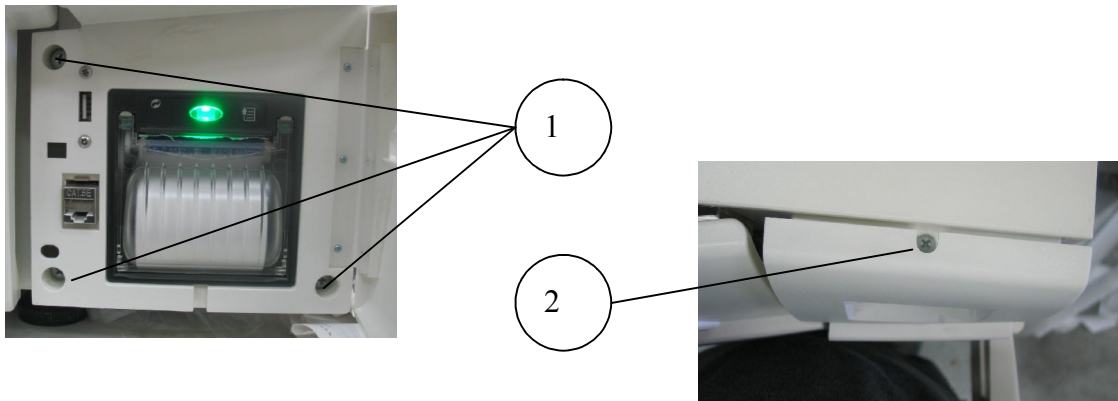


Caution!

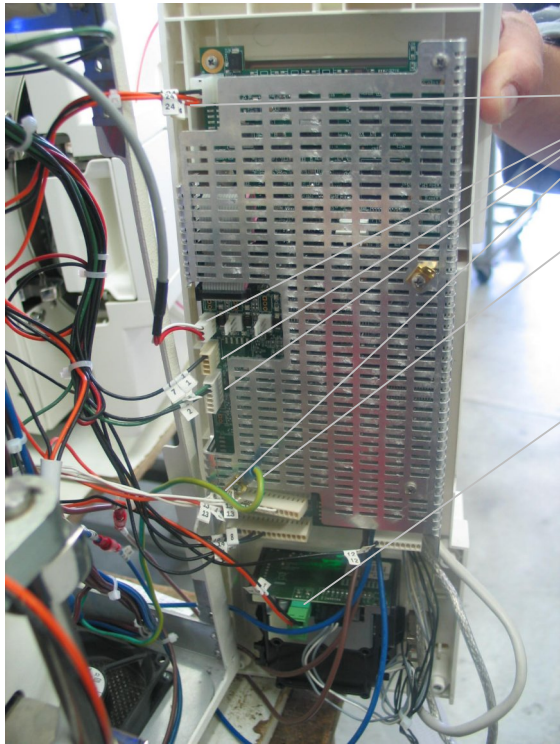
Before starting, disconnect the instrument from the power source and ensure that there is no pressure in the autoclave.

Allow the autoclave to cool before replacing the Control Panel.

1. Unscrew the three front fastening screws (1) and the upper fastening screw (2).



2. Pull the Control Panel open.
3. Disconnect the connectors (3)
4. Pull out the cable terminal (4)
5. Disconnect the printer connector (5)
6. Disconnect the power cables (6)
7. Replace the Control Panel with the new one and reconnect the connectors in the reverse order as described in steps 2-6.

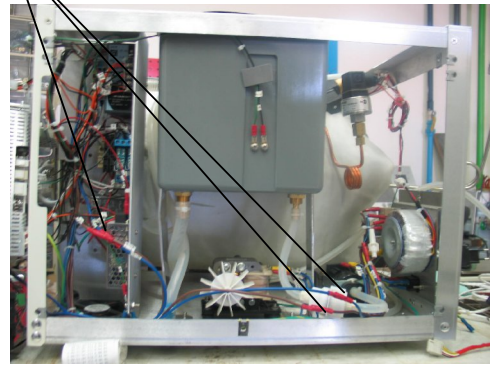
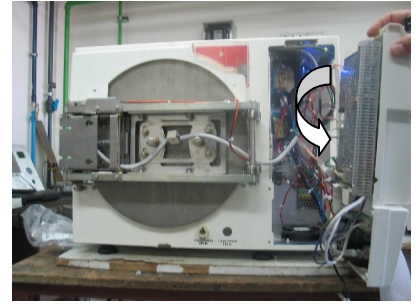


3

4

5

6



8.2 Replacing the Safety Valve



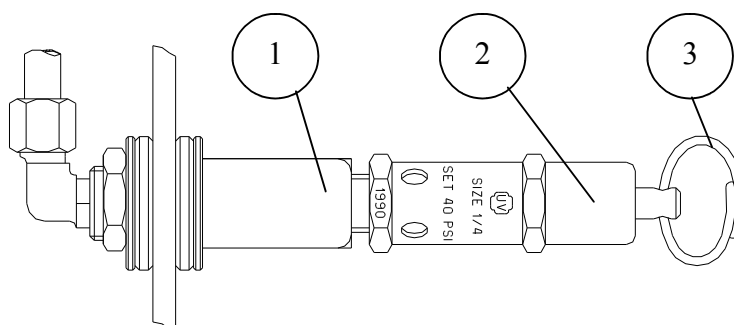
Caution!

Before starting, be sure that the electric cord is disconnected and that there is no pressure in the chamber, coil or generator.

Allow the autoclave to cool before removing outer covers.

The safety valve is installed to protect the system from over pressurizing should all the electrical controls fail.

1. Take off the autoclave cover (see sec. 9.3 “Removing the Autoclave’s Outer Covers”).
2. Remove the water reservoir gasket.
3. Unscrew the safety valve (2) and remove it from the safety valve base (1).
4. Replace the valve with a new safety valve (install only an original equipment replacement!). Use Teflon on the thread to seal it. Tighten the safety valve to prevent leaking.
5. Check the new safety valve. Turn on the autoclave and perform a cycle.
6. Pull the ring of the safety valve using a tool, i.e. screwdriver, hook etc and lift the safety valve ring for 2 seconds. Be careful not to burn your hands.
7. Press the STOP key to pause operation, and exhaust steam from chamber.
8. Wait until pressure goes down to zero, only then can the door be opened.

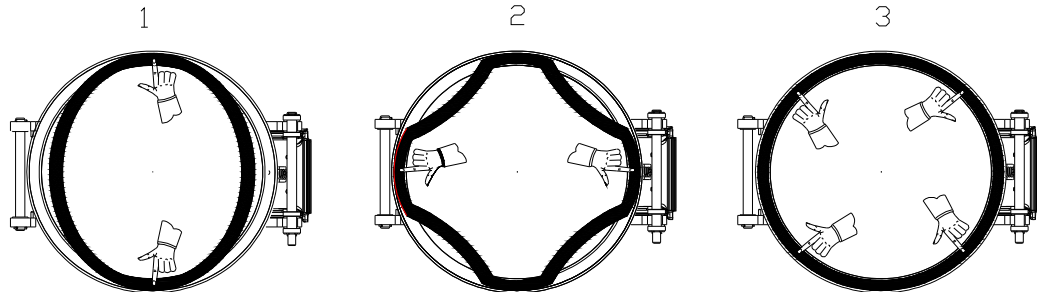


No.	Description
1	Safety valve base
2	Safety valve
3	Pressure relief nut

1.1. Replacing the Door Gasket



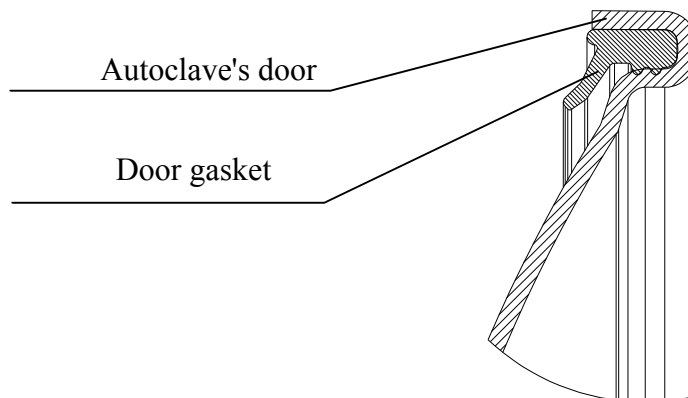
To avoid injuries replace the gasket while the autoclave is cold.



Pull off the gasket from the door groove and install the new gasket referring to the drawings as above points 1, 2 and 3.

CAUTION!

See drawing below for the right direction of the gasket.



8.3 *Cleaning and Replacing the Water Level Electrodes*

The water level electrodes are located at the bottom part of the chamber wall.

8.3.1 *Replacing*



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.

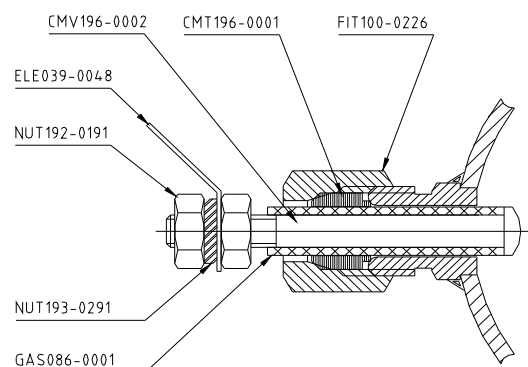
1. Open the right service door.
2. Disconnect the wire from the electrode connection.
3. Open the nut that tightens the electrode.
4. Insert a new electrode and tighten the fixing nut to avoid leakage.
5. Reconnect the wire to the electrode.
6. Test the unit.

8.3.1.1 *Cut-off electrode adjustment*

1. While the autoclave does not operate let water enter then chamber until the heating elements are covered.
2. Verify that when the heating elements are covered there is a gap between the water surface and the cut-off electrode.
3. If there is no gap – readjust the position of the electrode.

8.3.2 *Cleaning*

1. Remove the basket from the autoclave.
2. Clean the electrode tip.
3. Test the unit.



Water Level Electrode Assembly Cat No. CMT196-0016

8.4 Replacing the Printer

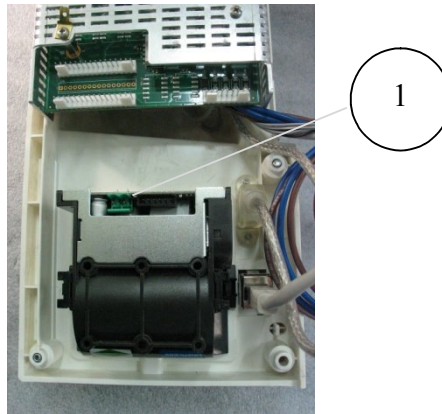


Caution

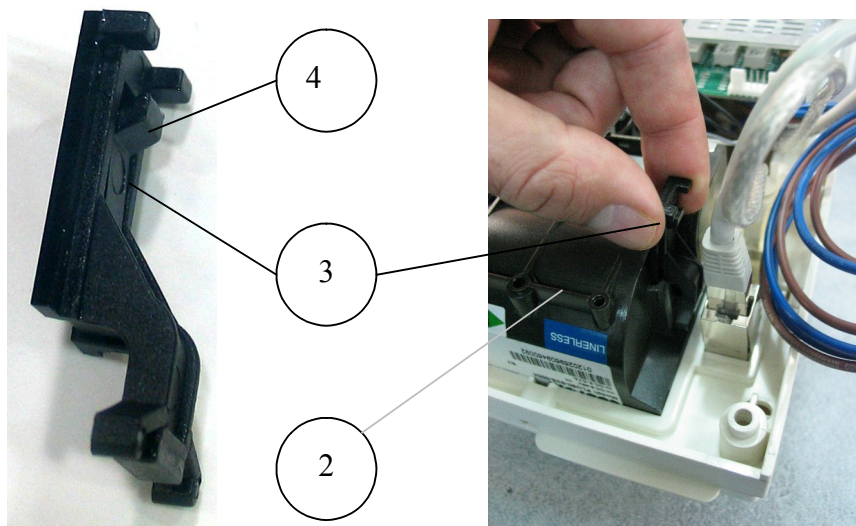
Before starting, disconnect the instrument from the power source and ensure that there is no pressure in the autoclave.

Allow the autoclave to cool before removing outer covers.

1. Release the control panel cover (see Replacing the Control Panel).
2. Your printer connector (1) is disconnected now.



3. The printer (2) is fastened to its seat with two fasteners (3). To release the fasteners, press slightly on the part marked (4) and pull the fastener upward. Repeat this with the second fastener.



4. Pull the printer out of its seat (the hole in the panel).



5. Replace the printer with a new printer.
6. Inset the fasteners. Verify that they are inserted firmly.
7. Insert the control panel on its place and fasten it with the screws.
8. Fasten the panel with the screws (1).

8.5 Replacing the Door Switch

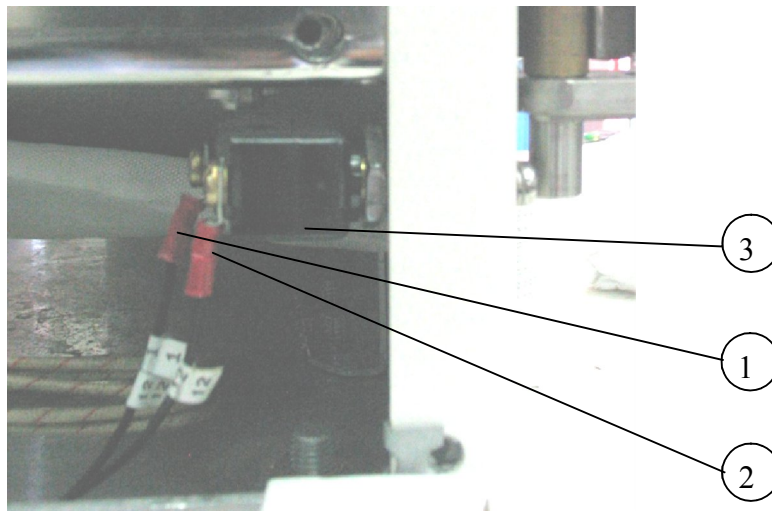


Caution!

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. Open the outer cover.
2. Disconnect the wires (1), (2) from the door switch (3).
3. Unscrew the two screws and remove the microswitch.
4. Replace the microswitch with a new one.
5. Test the connection with an ohmmeter. In “open” position the ohmmeter shows disconnection and in “close” position the ohmmeter shows connection.



8.6 *Replacing the Plunger or Coil of the BACCARA Solenoid Valve*

The solenoid valves may be out of order due to faulty plunger or coil. To repair the solenoid valve – replace the faulty plunger or solenoid

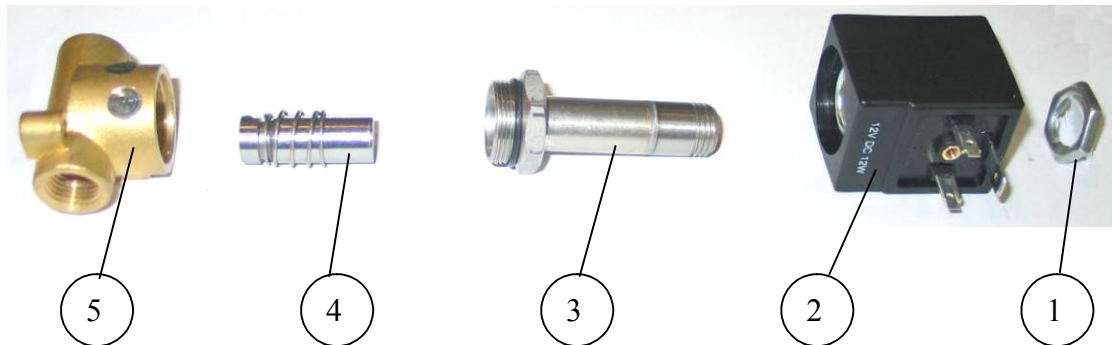


Caution!

Before starting, disconnect the instrument from the power source and ensure that there is no pressure in the chamber, coil.

Allow the autoclave to cool before removing outer covers.

1. Open the relevant service door to reveal the faulty BACCARA solenoid valve.
2. Unscrew and remove nut (1).
3. Remove the coil (2).
4. Unscrew the plunger + spring (4) with the plunger housing (3) and replace it with a new one. The plunger the spring and the housing are replaced as a kit.
5. Reassemble the coil (2) and the nut (1).
6. Re-install the autoclave cover.



8.7 Replacing the power supplies, water level board and relays

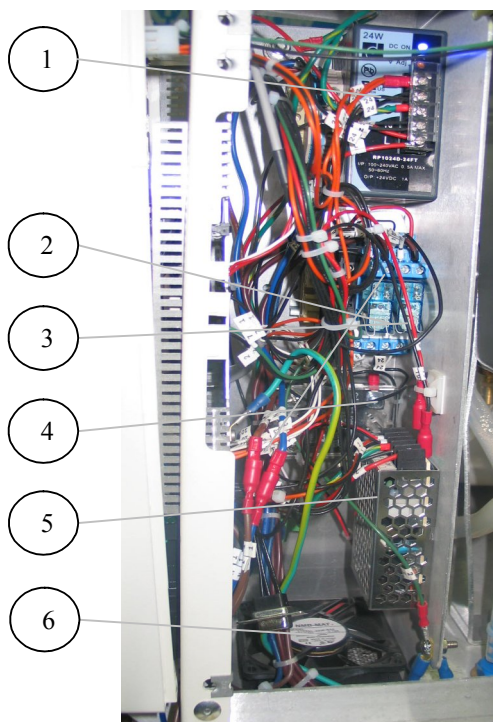


Caution!

Before starting, disconnect the autoclave from the power source.

For description of items – see table below.

1. Open right service door.
2. Disconnect the wires.
3. Replace the faulty items with a new one.
4. To replace the solid state relay (4), disconnect the electrical connections and unscrew screws.
5. Connect the electrical wires.
6. Close the service door.



<i>No.</i>	<i>Description</i>
1	Power supply
2	Air pump relay
3	Water pump relay
4	Solid state relay
5	Power supply
6	Fan

9. TROUBLESHOOTING

This troubleshooting chart enables the user to solve minor malfunctions, prior to contacting our service department.

Only technical personnel having proper qualifications and holding technical documentation (including a technician manual) and adequate information are authorized to service the apparatus.

Message / Symbol / Problem	Failure Description	Corrective Action
The machine is not responding	<ol style="list-style-type: none"> 1 The main switch is in 'OFF' position. 2 The power cord is disconnected from the machine or the mains. 3 The circuit breaker has tripped. 	<ol style="list-style-type: none"> 1 Turn the main switch to the 'On' position. (see front view drawing). 2 Make sure the power cord is connected properly to the machine and the mains. (see rear view drawing) 3 Lift the circuit breaker lever.
The printer prints, but nothing is printed on the paper.	<ol style="list-style-type: none"> 1 The Paper roll is not installed in the right way. (see Printer Handling in Operator's manual) 2 Faulty printer. 	<ol style="list-style-type: none"> 1 Install the paper roll in the right way. Only one side of the paper is printable. (see Printer Handling in Operator's manual) 2 Replace the printer.
The printer does not print.	<ol style="list-style-type: none"> 1 No paper is inserted in the printer. (see Printer Handling in Operator's manual) 2 No obvious reason. 3 If printer's LED is on – faulty printer. 4 Check 24V input to the printer. If none: <ul style="list-style-type: none"> — Discontinuity between power supply and printer. — Faulty power supply. 	<ol style="list-style-type: none"> 1 Make sure the paper roll is inserted in the printer. (see Printer Handling in operator's manual) 2 Switch off the machine and switch it back on for restart 3 Replace the printer. <ul style="list-style-type: none"> — Fix discontinuity. — Replace power supply.
The machine is leaking at the door	<ol style="list-style-type: none"> 1 The door gasket is dirty. (see Daily Maintenance in Operator's manual) 2 The door gasket is damaged. 	<ol style="list-style-type: none"> 1 Clean the door gasket. (see Daily Maintenance in Operator's manual). 2 Replace the door gasket.
Low Temp	<ol style="list-style-type: none"> 1 This message is displayed if the temperature drops for more than 1 second below the sterilization temperature during sterilization cycle. 2 Door gasket is leaking. 	<ol style="list-style-type: none"> 1 Perform a new cycle. 2 Replace the door gasket.
High Temp	<ol style="list-style-type: none"> 1 This message is displayed if the temperature raises 7°F (4°C) above sterilization temperature 	<ol style="list-style-type: none"> 1 Perform a new cycle. 2 Replace the door gasket.

Message / Symbol / Problem	Failure Description	Corrective Action
	during the sterilization stage for 2 seconds during sterilization cycle. 2 Door gasket is leaking.	
High Temp. (Ending)	1 This message is displayed if the system cannot reach the required temperature, in the chamber, within 10 minutes. 2 Slow exhaust valve does not receive comand due to faulty connection. 3 Slow exhaust valve does not receive comand due to faulty I.O. board. 4 Faulty Slow exhaust valve.	1 Perform a new cycle. 2 Fix connection. 3 Replace faulty I.O. board. 4 Replace faulty valve
High Temp. (Cooling)	1 This message is displayed if the system cannot reach the required temperature, in the cooling stage, within preset time. 2 Water to coil valve does not receive comand due to faulty connection. 3 Water to coil valve does not receive comand due to faulty I.O. board. 4 Faulty Water to coil valve.	1 Check and fix the city (tap) water supply. 2 Fix connection. 3 Replace faulty I.O. board. 4 Raplace faulty valve.
Heat Time Error	1 This message is displayed if the system cannot reach the required temperature, in the chamber, within the preset time. 2 Solenoid valves are leaking. 3 Faulty heating element.	1 Verify that the autoclave is not overloaded. 2 Clean or replace leaking valves. 3 Replace faulty heating element.
Low Pressure	1 This message is displayed if Chamber Pressure drops below the sterilization pressure (134°C = 304 kPa, 121°C = 205 kPa) for 2 seconds during the sterilization stage. 2 Leaking solenoid valves. 3 Faulty heating element.	1 Perform a new cycle. 2 Clean or replace faulty solenoid valves. 3 Replace faulty heating element.
Low Pressure (Cooling)	1 This message is displayed if the pressure in chamber does not reach the preset pressure before initiating the cooling stage. 2 Compressed air valve to chamber closed or leaking	1 Check and fix the compressed air supply. 2 Clean or replace leaking valve.
High Pressure	1 This message is displayed if	1 Perform a new cycle.

Message / Symbol / Problem	Failure Description	Corrective Action
	<p>Chamber Pressure raises 4.2 psi-29 kPa above sterilization pressure (134°C = 304 kPa, 121°C = 205 kPa) for 2 seconds during the sterilization stage.</p> <p>2 Heating element working contuously.</p> <p>3 System not calibrated.</p>	<p>2 Faulty solid state relay.</p> <p>3 Calibrate System.</p>
High Pressure (Ending)	<p>1 This message is displayed if the system cannot reach atmospheric pressure ± 10kPa during the ending stage.</p> <p>2 Heating element working contuously.</p> <p>3 System not calibrated.</p> <p>4 Water to coil valve does not receive comand due to faulty connection.</p> <p>5 Water to coil valve does not receive comand due to faulty I.O. board.</p> <p>6 Faulty Water to coil valve.</p>	<p>1 Perform a new cycle.</p> <p>2 Faulty solid state relay.</p> <p>3 Calibrate System.</p> <p>4 Fix connection.</p> <p>5 Replace faulty I.O. board.</p> <p>6 Raplace faulty valve.</p>
High Pressure (Exhaust)	<p>1 This message is displayed if the system cannot reach preset pressure within 10 minutes from the beginning of the exhaust stage.</p> <p>2 Exhaust valve does not open. Does not receive comand due to faulty connection.</p> <p>3 Exhaust valve does not open. Does not receive comand due to faulty I.O. board.</p> <p>4 Faulty Exhaustvalve.</p>	<p>1 Perform a new cycle.</p> <p>2 Fix connection.</p> <p>3 Replace faulty I.O. board.</p> <p>4 Raplace faulty valve.</p>
Pressure Time Error	This message is displayed if the system cannot reach the required pressure conditions in the chamber, after preset time, during the air removal stage.	Verify that the autoclave is not overloaded.
RTC Error - Please Set Current Date and Time	This message is displayed in order to set the date and the time.	<p>1 Set Current Date And Time.</p> <p>2 If the problem persists, replace the main board.</p>
Time Error	This message is displayed if the real time clock is faulty.	Replace the main board.
Air Error	1 This message is displayed at the end of the cycle If the autoclave does not reach the atmospheric	1 Wait until the autoclave reaches the atmospheric pressure and perform a

Message / Symbol / Problem	Failure Description	Corrective Action
	pressure after 10 minutes. 2 If problem persists, verify that the silicon tube of the air filter is not bent. 3 Air valve does not open. Does not receive comand due to faulty connection. 4 Air valve does not open. Does not receive comand due to faulty I.O. board. 5 Faulty Air valve.	new cycle. 2 Straighten silicon tube. 3 Fix connection. 4 Replace faulty I.O. board. 5 Raplace faulty valve.
Compressed air supply error (ELVC-D only)	1 This message is displayed in case of a compressed air supply malfunction. 2 Compressed Air valve does not open. Does not receive comand due to faulty connection. 3 Compressed Air valve does not open. Does not receive comand due to faulty I.O. board. 4 Faulty Compressed Air valve.	1 Check and fix the compressed air supply. 2 Fix connection. 3 Replace faulty I.O. board. 4 Raplace faulty valve.
Periodical check time exceeded - Please call for service	The periodical maintenance time has passed.	Perform, periodical maintenance operations
Cycle counter exceeded - Please call for service	Number of cycles, since last periodical maintenance, exceeded the preset number as defined by "cycle counter" parameter.	Perform, periodical maintenance operations
No Water	This message is displayed if the electrode in the chamber did not sense water within the preset time. 1 No mineral water supply. 2 Water inlet filter clogged. 3 Water level electrode is dirty. 4 The wire of the water level electrode is disconnected.	1. check and fix the mineral free water supply. 2. check and clean the water inlet filter. 3. Clean the water level electrode. 4 fix wire of the water level electrode
Fast exhaust operation is too slow.	Exhaust valve is faulty or pipe is clogged.	Replace exhaust valve or clean pipe.
Steam leaks through the door, despite the fact that door is tightly closed.	Check if the gasket is smooth, making sure the door closes properly.	Replace the faulty gasket.
The safety valve does not	1 Check the path of safety valve ensuring circulation is free.	1 If circulation is not free, remove the block.

Message / Symbol / Problem	Failure Description	Corrective Action
release pressure when blow-off test is performed.	2 Safety relief valve is faulty	2 Replace the faulty valve.
Safety relief valve opens at pressure lower than specified.	1 Safety relief valve is clogged. 2 Safety relief valve is faulty.	1 Replace relief valve and check the water quality. 2 Replace relief valve
Safety relief valve opens at pressure higher (more than 10%) than specified.	Safety relief valve is faulty.	Replace relief valve
Safety relief valve does not close in time (2-3 seconds).	Safety relief valve is faulty.	Replace relief valve
Safety relief valve leaks constantly.	Safety relief valve is faulty.	Replace relief valve and check the water quality.
Analog Input Error	This message is displayed when any Temperature sensor or Pressure sensor is disconnected or out of range.	Locate the cause of the problem according to displayed "View analog input state" and check relevant sensor.
Chamber temperature not in range	This message is displayed if the temperature in the chamber is too high or too low from the normal range. 1 Parameter "End Temperature" has been changed and is too low 2 Faulty temperature sensor. 3 Faulty command to the heating elements due to: — Short-circuit. — Faulty I/O board.	1 Correct parameter. 2 Replace faulty sensor. 3 fix the following: — Fix short-circuit. — Replace I/O board.
Chamber pressure not in range	This message is displayed if the pressure in the chamber is too high or too low from the normal range. 1 Wrong "atmospheric pressure" value. 2 Air inlet valve remains open. 3 Faulty command to the heating elements due to: — Short-circuit.	1 Open chamber's door for 2 minutes to readjust Wrong "atmospheric pressure" value. 2 Fix or replace air inlet valve. 3 Fix the following: — Fix short-circuit. — Replace I/O board. 4 Fix or replace Exhaust valve.

Message / Symbol / Problem	Failure Description	Corrective Action
	— Faulty I/O board. 4 Exhaust valve remains close.	
I/O Card Faild	This message is displayed if: 1 Disconnection between I/O board and Main board. 2 I/O card is faulty (both while cycle is running or not).	1 Fix disconnection, 2. replace faulty
I/O card is not connected	This message is displayed if: 1 Disconnection between I/O board and Main board. 2 I/O card is faulty (both while cycle is running or not).	1 Fix disconnection, 2. replace faulty
Error Locking (following closing the door)	1 One or both microswitches on the door frame are disconnected 2 One or both microswitches on the door frame are faulty.	1 Fix disconnections. 2 Replace the faulty microswitches
Door Error (following opening the door)	1 The microswitches actuated by the motor mechanism is disconnected 2 The microswitches actuated by the motor mechanism is faulty.	1 Fix disconnections. 2 Replace the faulty microswitches
Vacuum Time Error	This message is displayed if the preset vacuum is not reached within the preset time.	Perform a new cycle.
Low Vacuum	Vacuum pump runs but no vacuum is produced due to:	
		Door seal is dirty or faulty. Clean or replace the door seal.
		Piping is leaking. Fix the leak.
		A valve is leaking - Fast Exhaust (73), Air to Vac (44), Air (43). Take apart, clean and inspect seats - replace if worn or damaged
		Vacuum valve (52) control circuit is faulty. Run the in/out test to check if the valve has magnetism. If not, replace the coil. If this doesn't help, check the wiring from the valve to the control system.
		Air to vacuum valve (44) coil is faulty. Run the in/out test to check if the valve has magnetism. If not, replace the coil. If this doesn't help, check the wiring from the valve to the control system.
		Cooler is leaking. Replace cooler.
		Cooler fan is faulty. Replace fan.
		Pump need to be rebuilt. Install rebuilding kit.

Message / Symbol / Problem	Failure Description		Corrective Action
	Vacuum pump does not operate due to:	Pump's fuse burnt	Replace fuse.
		Disconnected wire.	Reconnect wires.
		Faulty vacuum pump	Replace the faulty vacuum pump.
		AC high voltage power board is faulty.	Replace the board.

10. LIST OF SPARE PARTS

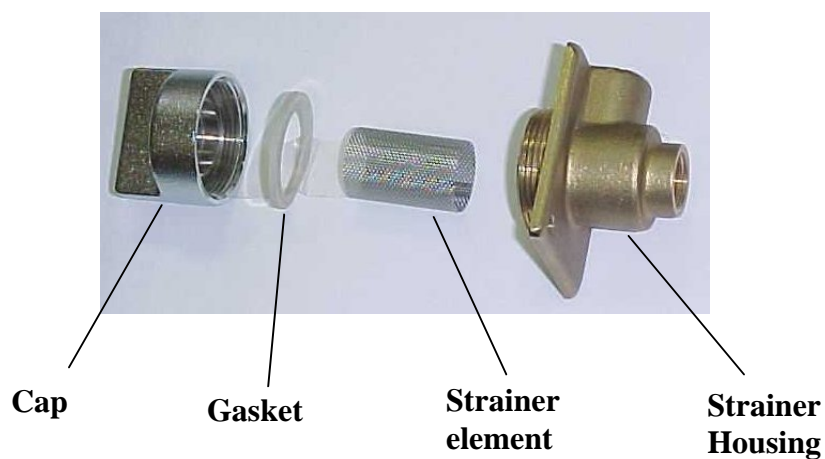
Part No.	Description
BOL191-0158	Pan Head Machine Screw, Phillips, M4x8, St. St. A2, DIN7985
CMT098-0002	Nipple, Water level electrode
ELE036-0036	Limit Switch, Snap-Action, Formed Lever, Light, SPDT, 10A/250VAC
LOK411-0044	Safety Switch Holder for Elara door
BOL191-0136	Hex Socket Flat Cap Screw, 1/4UNCx5/8, St. St. A2
LOK254-0001	Washer, locking solenoid pin, 1730, 2340, 2540
LOK411-0018	Solenoid pin -Elara
SOL027-0003	Solenoid, Door Lock, TPGx12-C-24VDC, Guardian
SPR177-0004	Spring, Solenoid, Door Locking, 1730, 2340, 2540
BOL191-0070	Flat Head Machine Screw, Phillips, M4x10, St. St. A2, DIN965
SPR177-0023	
LOK692-0039	Pin, Cotter, 2.0x16
NUT193-0317	Spring Lock Washers With Square Ends, 1/4, St. St. A2, DIN127B
LOK692-0039	Pin, Cotter, 2.0x16
NUT193-0283	Plain Washer, 1.2X7.45X16.1, Stainless Steel A2
NUT193-0317	Spring Lock Washers With Square Ends, 1/4, St. St. A2, DIN127B
THE039-0036	Connector, Ceramic, No.3, Double
FIT100-0806	Male Adapter, Elbow, 90°, 1/8"BSP For 6mm Hose
PUM055-0006	Water Pump, 230V, 50Hz, Ulka
SKR203-0006	Shock Absorber, SRB, 85/90 SHORE fot ULKA Pump.
BOL191-0155	Pan Head Machine Screw, Phillips, M5x20, St. St. A2, DIN7985
NUT193-0275	Plain Washer, 1X5.3X13, Stainless Steel A2
PUM057-0055	Vacuum Pump, Diaphragm, 230V, UL, ASF Thomas
SKR203-0009	Shock Absorber, Ø20.5x6.5x5.5mm, EP 70 DURO
ARM100-0152	Heat Exchanger, 15/04x10x0127/16, Lordan
CTP201-0159	Fan, 230VAC, 150x172x38
FIL175-0069	Fan guard, 170 mm, NiCr plated, FGW-162A-5, Cooltron
BOL191-0140	Pan Head Machine Screw, Phillips, M4x12, St. St. A2, DIN7985
BOL191-0158	Pan Head Machine Screw, Phillips, M4x8, St. St. A2, DIN7985
CMT240-0020	Nut, 3/8"BSP, Water Reservoir
CMT240-0022	Washer, 30mm, Brass, Water Reservoir

Part No.	Description
CMT411-0041	Holder, Safety Valve, TTA
ELE039-0048	Terminal, male, brass, w/o isolation, PC1L18704LR, K.S. Terminals
FIT100-0216	Sleeve, Tube 1/4, Brass, 60C-4, Parker
FIT100-0226	Nut for Sleeve, Tube 1/4, Thread 7/16-24, Brass
FIT100-0806	Male Adapter, Elbow, 90°, 1/8"BSP For 6mm Hose
GAS080-0022	O-Ring, 2.84 x 8.08, W=2.62, 2-104 EPDM
NUT193-0340	Teflon Ring for water tank
PIP411-0002	Coil, Cooling, ELARA
RES411-0004	Reservoir, Main Water Tank, Injection, ELARA
COV411-0001	Cover, Chamber Isolation, ELARA 11
ELE036-0036	Limit Switch, Snap-Action, Formed Lever, Light, SPDT, 10A/250VAC
ELE036-0026	Limit Switch, Snap-Action, SPDT, 20A, 250VAC, 2HP, Screw terminal
LOK411-0044	Safety Switch Holder for Elara door
NUT192-0192	Hex Nut, M5X4, Stainless Steel A2, DIN934
NUT192-0230	Nut, Clip-On, U-Style, 4.8x20x13, 0.7 thick, Spring steel, Cadmium plated
NUT193-0275	Plain Washer, 1X5.3X13, Stainless Steel A2
FIL175-0020	Filter, Water, PVC
FIT100-0084	Nipple, Parallel, 1/2*1/4 NPT, Brass, S11420, Sistem Pneumatica
FIT100-0309	Male Elbow 90°, Twin Ferrule, 1/4"NPTx5/16" Tube, Brass
GAS083-0002	Tube, Silicone, Clear, Translucent, 5x10mm, 58 Shore A
GAS086-0017	Tube, Teflon, 6x8mm
SOL026-0032	Valve, Solenoid, Brass, 2/2 way, 1/4"BSPx4.0, NC, GEM-A-22017, Baccara
ARM100-0057	Steam Trap, 1/4"NPT, St.St.
CMT100-0004	Nipple, Hex, 1/4"x1/4", NPTxNPT For TTA
FIT100-0081	Elbow, 90, Equal, F & M, 1/4"NPT, Brass
SOL026-0032	Valve, Solenoid, Brass, 2/2 way, 1/4"BSPx4.0, NC, GEM-A-22017, Baccara
VLV170-0022	Valve, Needle, 1/4", Bronze NPT
SVL029-0028	Safety Valve, PED, 1/4" MPTxDisch. H., Brass Body, Brass Seat, 2.8Bar
WHE070-0016	Leg, Rubber, Plug Type, 25x1/4x14, Human
BOL191-0091	Pan Head Machine Screw, Phillips, M4X20, St. St. A2, DIN7985
BOL194-0340	Pan Head Tapping Screw, Philips, 4.8x13, Flat Point, DIN7981 FH

Part No.	Description
ELC240-0022	Sensor, Temperature, 5x100, 54400, Sontec, Assy.
GAS080-0022	O-Ring, 2.84 x 8.08, W=2.62, 2-104 EPDM
THE003-0002	Sensor, Temperature, PT100, 5x100, Sontec
ELE035-0092	Transformer, 2x115 / 2x12, 50/60 hz, TDB-100, Jishisheng
NUT192-0206	Hex Nut, 5-40UNC, Brass, Plain
THE005-0003	Thermostat, Safety, 180C, TY95/AC, Campini
THE005-0014	Thermostat, Cut-Off, TY95-H, 230C, Campini
WIR040-0016	Socket, Cable, Electric, 15A, USA
CTP201-0065	Relay, Solid State, 25A/24-280V
CTP201-0272	Miniature PCB relay, coil 24VDC, contact 250VAC, 8A, 2 pole
CTP201-0275	Relay Socket
CTP201-0284	Fan, 80x20mm, 0.15A, 24VDC
SOL026-0077	Connector, 2 Contacts, 24V, Black, DIN43650, KA132L34B9, CNE
ELE035-0009	Fuse, 5x20mm, Glass tube, 250V, 2A,F
ELE035-0144	Power Supply, 24VDC, 1A
ELE035-0170	Fuse, 5x20mm, Glass tube, 250V, 5A, SB
CPN064-0031	Keyboard, EZ 9"&11", EZ/3870-D & Hor.-D
CTP200-0138	Board, I/O Extension, Bacsoft
CTP200-0140	Board, Main Control, Bacsoft
ELC258-0012	Shield, Control Unit Boards, Bacsoft
ELE035-0102	Circuit Breaker,2Pole,15A,250VAC,White
ELE039-0048	Terminal, male, brass, w/o isolation, PC1L18704LR, K.S. Terminals
POL067-0010	Door, Printer Opening, 11" E
POL067-0013	Hinge, Printer Opening Door, 9"&11" E/M
POL067-0048	Window, Clear for Control Sys. Screen - Bacsoft
THE002-0052	Panel printer, Thermal, 24 Columns
THE002-0061	Full Color graphical display 3.5"
WIR040-0170	
WIR040-0180	Cord, extension, USB 2.0 type A - panel F to M, 35 cm
NUT192-0217	Hex Nut, 8-32UNC, Brass, Plain
NUT193-0291	Serrated Lock Washer External Teeth,M4(5/32),Steel,Zinc Pl.,DIN6798A
SOL026-0018	SOL026-0018 Coil, Solenoid, 24VAC, 8W, 50Hz, Bac.
POL065-0006	Cover, Validation Port, 2340
POL065-0041	Cover, Door, 11" , Initial assembly
POL067-0004	Cover, Reservoir, Fill water

Part No.	Description
POL067-0011	Shield, Opening Handle, 9"&11" E/M
POL067-0012	Cover, Opening Handle, 9"&11" E/M
CMT196-0001	Bushing, water level electrode
CMT196-0004	Electrode, Water Level, Assembly, For Electronic TTA Length: 58mm
GAS086-0001	Tube, Teflon, Water Level Electrode
CMV196-0002	Electrode, Water Level, 58mm, TTA
ELE039-0048	Terminal, male, brass, w/o isolation, PC1L18704LR, K.S. Terminals
NUT192-0191	Hex Nut, M4X3.2, Stainless Steel A2, DIN934
NUT193-0292	Serrated Lock Washers External Teeth, M6, Steel,Zinc Plated,DIN6798A
FIT100-0226	Nut for Sleeve, Tube 1/4, Thread 7/16-24, Brass
WIR040-0003	ELECTRIC CABLE PLUG+SOCKET 10A, 250V, EUR

WATER OUTLET STRAINER



Description	Cat. No.
Cap for 1/4" strainer	FIL175-0027
Strainer element	FIL175-0046
Teflon gasket 4 mm	GAS082-0008
Strainer Housing + Cap	FIL175-0051

11. PRESSURE VS TEMPERATURE FOR SATURATED STEAM

psia	InHg	°F	Bar	kPa	°C	psia	psig	°F	Bar	kPa	°C
1.5	2.95	114.5	0.10	10	45.8	17.1	2.4	219.7	1.18	117.9	104.3
2.2	4.44	129.3	0.15	15	54.1	17.2	2.5	219.9	1.18	118.6	104.4
2.9	5.90	140.2	0.20	20	60.1	17.2	2.5	220.1	1.19	118.6	104.5
3.6	7.39	149.1	0.25	25	65.0	17.3	2.6	220.3	1.19	119.3	104.6
4.4	8.86	156.4	0.30	30	68.9	17.4	2.7	220.5	1.20	120.0	104.7
5.1	10.34	162.9	0.35	35	72.7	17.4	2.7	220.6	1.20	120.0	104.8
5.8	11.81	168.6	0.40	40	75.9	17.5	2.8	220.8	1.20	120.4	104.9
6.5	13.30	173.8	0.45	45	78.8	17.5	2.8	221.0	1.21	120.7	105.0
7.3	14.76	178.4	0.50	50	81.3	17.6	2.9	221.2	1.21	121.3	105.1
						17.7	3.0	221.4	1.22	122.0	105.2
psia	psig	°F	Bar	kPa	°C	17.7	3.0	221.5	1.22	122.0	105.3
14.7	0.0	212.0	1.01	101.3	100.0	17.8	3.1	221.7	1.23	122.7	105.4
14.8	0.1	212.2	1.02	101.7	100.1	17.8	3.1	221.9	1.23	122.7	105.5
14.8	0.1	212.4	1.02	102.1	100.2	17.9	3.2	222.1	1.23	123.4	105.6
14.9	0.2	212.5	1.02	102.4	100.3	18.0	3.3	222.3	1.24	124.1	105.7
14.9	0.2	212.7	1.03	102.8	100.4	18.0	3.3	222.4	1.24	124.1	105.8
15.0	0.3	212.9	1.03	103.2	100.5	18.1	3.4	222.6	1.24	124.7	105.9
15.0	0.3	213.1	1.04	103.6	100.6	18.2	3.5	222.8	1.25	125.1	106.0
15.1	0.4	213.3	1.04	104.0	100.7	18.2	3.5	223.0	1.26	125.5	106.1
15.1	0.4	213.4	1.04	104.3	100.8	18.3	3.6	223.2	1.26	126.0	106.2
15.2	0.5	213.6	1.05	104.7	100.9	18.3	3.6	223.3	1.26	126.2	106.3
15.2	0.5	213.8	1.05	105.1	101.0	18.4	3.7	223.5	1.27	126.8	106.4
15.3	0.6	214.0	1.05	105.4	101.1	18.5	3.8	223.7	1.27	127.2	106.5
15.4	0.7	214.2	1.06	105.8	101.2	18.5	3.8	223.9	1.28	127.7	106.6
15.4	0.7	214.3	1.06	106.2	101.3	18.6	3.9	224.1	1.28	128.1	106.7
15.5	0.8	214.5	1.07	106.6	101.4	18.6	3.9	224.2	1.29	128.5	106.8
15.5	0.8	214.7	1.07	106.9	101.5	18.7	4.0	224.4	1.29	129.0	106.9
15.6	0.9	214.9	1.07	107.3	101.6	18.8	4.1	224.6	1.29	129.6	107.0
15.6	0.9	215.1	1.08	107.7	101.7	18.9	4.2	224.8	1.30	129.9	107.1
15.7	1.0	215.2	1.08	108.1	101.8	18.9	4.2	225.0	1.30	130.4	107.2
15.7	1.0	215.4	1.08	108.4	101.9	19.0	4.3	225.1	1.31	130.8	107.3
15.8	1.1	215.6	1.09	108.8	102.0	19.0	4.3	225.3	1.31	131.3	107.4
15.8	1.1	215.8	1.09	109.2	102.1	19.1	4.4	225.5	1.32	131.7	107.5
15.9	1.2	216.0	1.10	109.6	102.2	19.2	4.5	225.7	1.32	132.2	107.6
16.0	1.3	216.3	1.10	110.0	102.4	19.3	4.6	225.9	1.33	132.6	107.7
16.1	1.4	216.5	1.11	110.7	102.5	19.3	4.6	226.0	1.33	133.1	107.8
16.1	1.4	216.7	1.11	111.1	102.6	19.4	4.7	226.2	1.34	133.5	107.9
16.2	1.5	216.9	1.12	111.5	102.7	19.4	4.7	226.4	1.34	134.0	108.0
16.2	1.5	217.0	1.12	111.9	102.8	19.5	4.8	226.6	1.34	134.4	108.1
16.3	1.6	217.2	1.12	112.3	102.9	19.6	4.9	226.8	1.35	134.9	108.2
16.4	1.7	217.4	1.13	112.7	103.0	19.6	4.9	226.9	1.35	135.3	108.3
16.4	1.7	217.6	1.13	113.1	103.1	19.7	5.0	227.1	1.36	135.8	108.4
16.5	1.8	217.8	1.14	113.5	103.2	19.8	5.1	227.3	1.36	136.2	108.5
16.5	1.8	217.9	1.14	114.0	103.3	19.8	5.1	227.5	1.37	136.7	108.6
16.6	1.9	218.1	1.14	114.3	103.4	19.9	5.2	227.7	1.37	137.1	108.7
16.6	1.9	218.3	1.15	114.7	103.5	19.9	5.2	227.8	1.38	137.6	108.8
16.7	2.0	218.5	1.15	115.1	103.6	20.0	5.3	228.0	1.38	138.1	108.9
16.8	2.1	218.7	1.16	115.6	103.7	20.1	5.4	228.2	1.39	138.5	109.0
16.8	2.1	218.8	1.16	116.0	103.8	20.2	5.5	228.4	1.39	139.0	109.1
16.9	2.2	219.0	1.16	116.3	103.9	20.3	5.6	228.6	1.39	139.5	109.2
16.9	2.2	219.2	1.17	116.7	104.0	20.3	5.6	228.7	1.40	140.0	109.3
17.0	2.3	219.4	1.17	117.1	104.1	20.4	5.7	228.9	1.40	140.5	109.4
17.1	2.4	219.6	1.18	117.5	104.2	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											

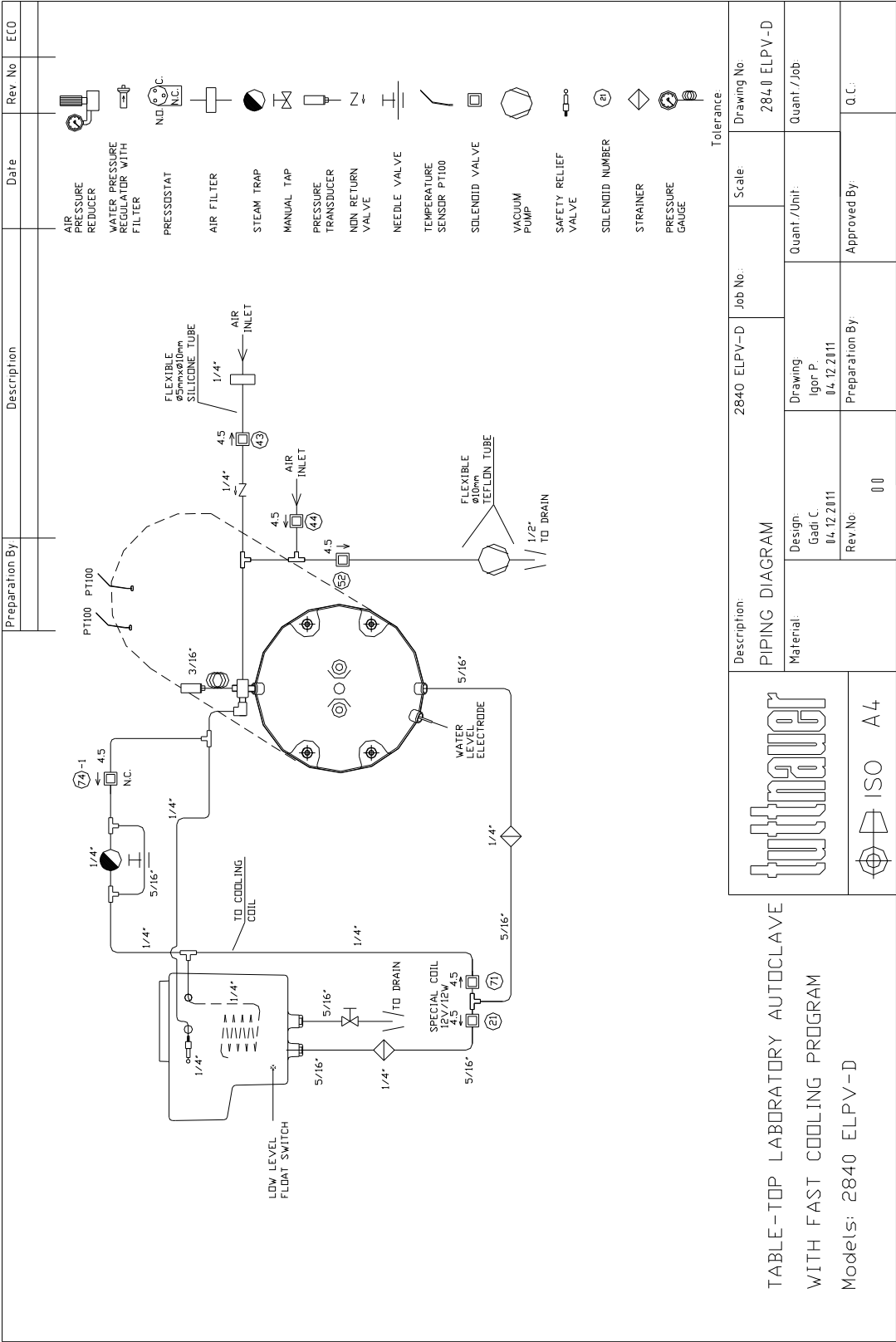
12. VALVES NUMBERING

The valves in the drawing and the manual are numbered according to their function.
The following list includes all the valve numbers that are in use in Tuttnauer

0.	FUNCTION	01. Change-over : steam / electricity 02. Locking door cylinder (front door) 03. Locking door cylinder (Rear door)
1.	FEED WATER	11. Feed water – cool jacket 12. Feed water – cool heat exchanger 13. Feed water – cool fast exhaust 14. Feed water – to reservoir 15. feed water – to vacuum pump 16. Water outlet 17. Shut 18. Feed water – to ejector
2.	MINERAL FREE WATER	21. Mineral free water - inlet 22. Detergent 23. To spray 24. Recycling inlet 25. Recycling outlet
3.	COMPRESSED AIR	31. Air inlet 32. Air inlet - to chamber 33. To splash cooling pipe 34 – 1. To door 1 seal 34 – 2. To door 2 seal 38 – 1. Open door 1 38 – 2. Open door 2 39 – 1. Close door 1 39 – 2. Close door 2
4.	AIR	41. Air release N.C. 42. Air release N.O. 43. Filtered air - inlet 44. Air Inlet 45. Aeration
5.	VACUUM	51. Vacuum - break 52. Vacuum - to pump 53.1 Vacuum - from door 1 seal 53-2. Vacuum - from door 2 seal


6.	DRAIN	61. Drain – from reservoir 62. Drain – from jacket overflow 63. Drain – from vacuum pump / ejector 64. Drain – from chamber 65. Drain – from cooler 66. Drain – from sanitary filter 68. Drain – jacket 69. Drain – condense from seal
7.	EXHAUST	70. Exhaust – from chamber 71. Exhaust – to reservoir 72. Exhaust – to drain 73. Fast exhaust 74. Slow exhaust 75. Exhaust to ejector / to vacuum pump 76. Exhaust – from heat exchanger 78. Exhaust through heat exchanger (pre-vacuum stage only) 79. Jacket steam trap
8.	GAS	81. Inlet 82. Main inlet 83. Inlet through humidifier
9.	STEAM	90. Steam – from building source 91. Steam – to jacket (From outer source) 92. Steam – inlet 93. Steam – to chamber 94 – 1. Steam – to door 1 seal 94 – 2. Steam – to door 2 seal 95. Steam – to heat exchanger 96. Steam – to sanitary filter 98. Steam – to activate ejector

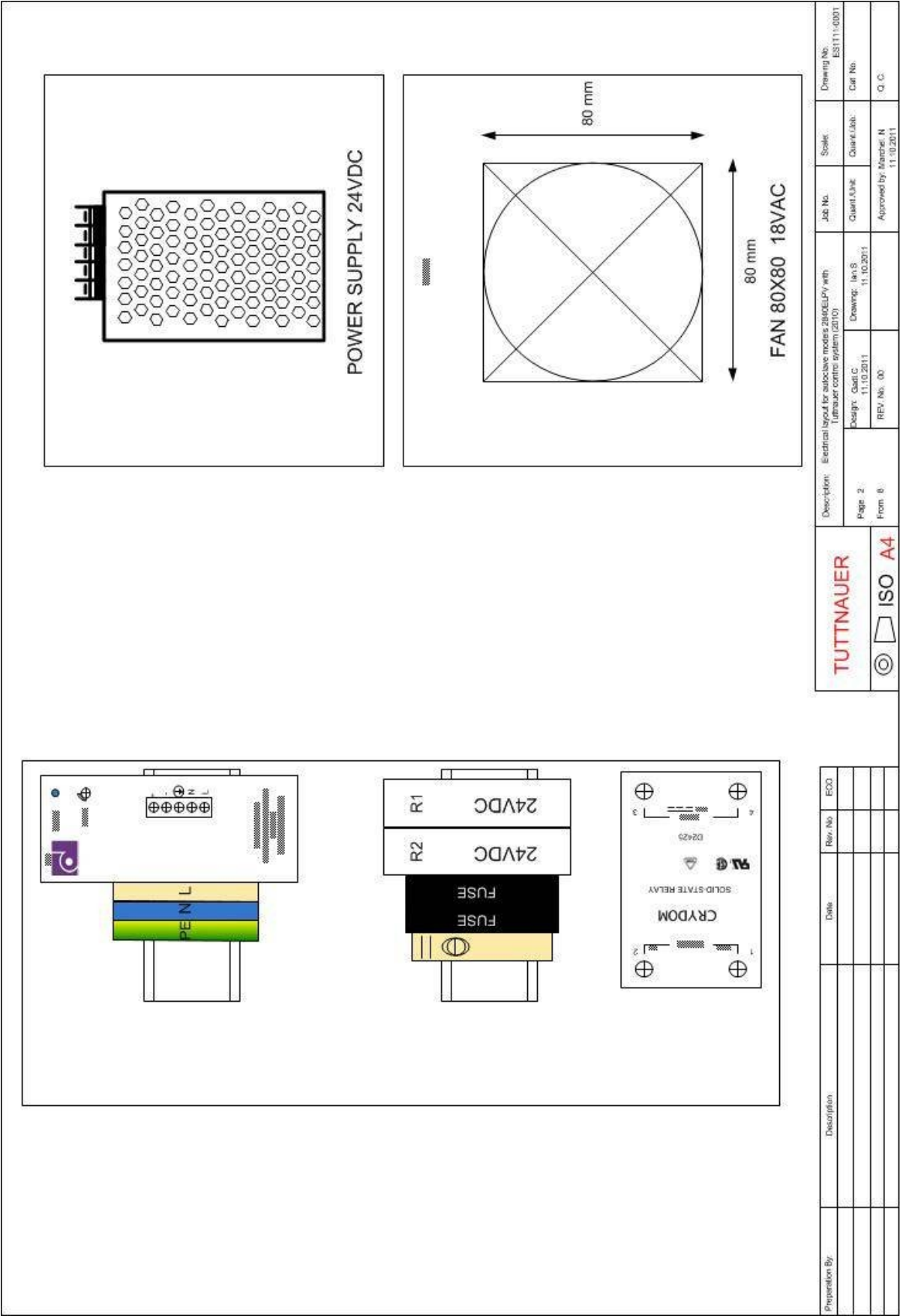
PIPING DRAWING – MODEL 2840 ELPV



List of Drawings for autoclave model 2840ELPV with Tuttnauer control system (2010)

No.	Drawing No.	Description	Rev.	Quantity
1	ES1T11-0001	List of Drawings for autoclave model 2840ELPV with Tuttnauer control system (2010)	00	1
2	ES1T11-0001	Electrical layout for autoclave models 2840ELPV with Tuttnauer control system (2010)	00	1
3	ES1T11-0001	Autoclave model 2840ELPV electrical drawing high voltage 220V AC, 10A, 50/60Hz	00	1
4	ES1T11-0001	Schematic I/O & MAIN Boards Tuttnauer control system (2010)	00	1
5	ES1T11-0001	2840ELPV - ANALOG INPUTS Tuttnauer control system (2010)	00	1
6	ES1T11-0001	2840ELPV - ANALOG OUTPUTS Tuttnauer control system (2010)	00	1
7	ES1T11-0001	2840ELPV - DIGITAL INPUTS Tuttnauer control system (2010)	00	1
8	ES1T11-0001	2840ELPV - DIGITAL OUTPUTS Tuttnauer control system (2010)	00	1

Prepared By:	Description:	Date:	Rev. No.	ECO	<div><div>TUTTNAUER</div><div> ISO A4</div></div>	Description: List of Drawings for autoclaves models 2840ELPV with Tuttnauer control system (2010) Page 1 Design: 11.10.2011 Draft C: 11.10.2011 REV. No 00	Drawing: 11.10.2011 Jan. B Drawing	Scale: Quant./Unit	Job No.	Drawing No. ES1T11-0001



ELECTRICAL WIRING DIAGRAM FOR AUTOCLAVE WITH 230V – PAGE 3 of 8

