EGIC STEAM STERILIZER OPERATIONAL MANUAL

Double / Single Door

Rev 1.3, 8/2022

A WORD FROM EGIC

This manual contains important information on proper use of **EGIC** Steam Sterilizer. All operators and department heads must carefully review and become familiar with the warnings, cautions and instructions contained in this manual. These instructions are important to the health and safety of personnel operating the sterilizer and should be retained in a conveniently accessible area for quick reference.

Service Information

A thorough preventive maintenance program is essential for safe and proper sterilizer operation. You are encouraged to contact **EGIC** concerning our Preventive Maintenance Agreement. Under terms of this agreement, preventive maintenance, adjustments, and replacement of worn parts are done on a scheduled basis to assure equipment performance at peak capability and to help avoid untimely or costly interruptions.

Indication for Use

The **EGIC**® Series of Steam Sterilizers is designed for sterilization of heat- and moisture-stabile materials used in healthcare facilities. The Prevacuum sterilizer is equipped with Prevacuum, Gravity, EXPRESS, Leak Test, DART (Bowie-Dick) and DART Warm-up cycles.

Advisory

This sterilizer is specifically designed to only process goods using the cycles as specified in this manual. If there is any doubt about a specific material or product, contact the manufacturer of that product for the recommended sterilization technique.

A summary of the safety precautions to be observed when operating and servicing this equipment can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.

Any alteration of the sterilizer not authorized or performed by **EGIC** Engineering Service which could affect its operation will void the warranty, could adversely affect sterilization efficacy, could violate national, state and local regulations and jeopardize your insurance coverage.

Table of Contents

Section 1: Listing of Warnings and Cautions

Following is a list of the safety precautions which must be observed when operating this equipment. WARNINGS indicate the potential for danger to personnel, and CAUTIONS indicate the potential for damage to equipment. These precautions are repeated (in whole or in part), where applicable, throughout the manual. This is a listing of all safety precautions appearing in the manual. Carefully read them before proceeding to use or service the unit.

WARNING – ELECTRIC SHOCK AND BURN HAZARD:

⚠ **Disconnect all utilities to sterilizer before servicing.** Do not service the sterilizer unless all utilities have been properly locked out. Always follow OSHA Lockout-Tagout and electrical safety-related work practice standards. (See CFR 1910.147 and .331 through .335.)

WARNING – PERSONAL INJURY HAZARD:

⚠ **Avoid personal injury from bursting bottles.** Liquid sterilization cycle must only be used for liquids in borosilicate

(Pyrex) flasks with vented closures.

⚠ **Door must be locked and the key retained prior to entering chamber for servicing.** Always follow appropriate Lockout-Tagout and electrical safety-related work practice standards. Emergency stop switch can be depressed and key retained on sliding door units.

WARNING:

⚠ **It is inappropriate for a healthcare facility to sterilize liquids** for direct patient contact.

WARNING – BURN HAZARD:

⚠ **Sterilizer, rack/shelves, and loading car will be hot after cycle is run**. Always wear protective gloves and apron when removing a processed load. Protective gloves and apron must be worn when reloading sterilizer following the previous operation.

WARNING – BURN HAZARD:

⚠ **Do not** attempt to open the sterilizer door if a **WATER IN CHAMBER ALARM** condition exists. Call a qualified service technician before attempting to use sterilizer further.

⚠ **After manual exhaust, steam may remain inside the chamber.** Always wear protective gloves, apron, and a face shield when following emergency procedure to unload sterilizer. Stay as far back from the chamber opening as possible when opening the door.

⚠ **Allow sterilizer to cool to room temperature** before performing any cleaning or maintenance procedures.

⚠ **Failure to shut off the steam supply** when cleaning or replacing strainers can result in serious injury.

⚠ **Jacket pressure must be 0 psig before beginning work on the steam trap.**

WARNING – BURN HAZARD:

⚠ **Proper testing of the safety valve requires the valve to be operated under pressure.** Exhaust from the safety valve is hot and can cause burns. Proper safety attire (gloves, eye protection, insulated overall) as designated by OSHA, is required. Testing is to be performed by qualified service personnel only.

⚠ **Steam may be released from the chamber when door is opened.** Step back from the sterilizer each time the door is opened to minimize contact with steam vapor.

WARNING – EXPLOSION HAZARD:

⚠ **This sterilizer** is not designed to process flammable compounds.

WARNING – SLIPPING HAZARD:

⚠ **To prevent falls, keep floors dry** by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

⚠ **Regularly scheduled preventive maintenance is required** for safe and reliable operation of this equipment.

Contact your **EGIC** service representative to schedule preventive maintenance.

⚠ **When closing the chamber door,** keep hands and arms out of the door opening and make sure opening is clear of obstructions.

⚠ **Repairs and adjustments to this equipment** must be made only by fully qualified service personnel. Maintenance performed by inexperienced, unqualified persons or installation of unauthorized parts could cause personal injury or result in costly equipment damage.

WARNING – STERILITY ASSURANCE HAZARD:

⚠ **Load sterility may be compromised if the biological indicator or air leak test indicates a potential problem**.

If these indicators show a potential problem, refer the situation to a qualified service technician before using the

sterilizer further.

⚠ **According to AAMI standards, a measured leak rate greater than 1 mm Hg/minute (1.3 mbar/min) indicates a problem with the sterilizer.** Refer the situation to a qualified service technician before using the sterilizer further.

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

⚠ Gasket must be fully retracted prior to operating sterilizer door.

⚠ If 0 dry time is selected, sterilizer automatically initiates a vapor removal phase in place of drying. This phase can still draw a vacuum to 5 inHg. Consult device manufacturer's recommendations to ensure devices being processed can withstand this depth of vacuum.

⚠ Lifting the chamber float switch when cleaning the chamber may cause the sterilizer control to initiate a "Chamber Flooded" alarm. If this alarm condition occurs, the operator must turn the control power OFF then ON to clear the alarm. The control power switch is located in the mechanical area at the side of the sterilizer. Placing the sterilizer in standby does not clear this alarm.

⚠ Never use a wire brush, abrasives, or steel wool on door and chamber assembly. Do not use cleaners containing chloride on stainless-steel surfaces. Chloride-based cleaners will deteriorate stainless steel, eventually leading to failure of the vessel.

⚠ Do not use cleaners containing chlorides on loading cars. Chloride-based cleaners will deteriorate the loading car metal.

⚠ Sterilization of chloride-containing solutions (e.g., saline) can cause chamber corrosion and is not recommended by the manufacturer. If, however, chloride-containing solutions must be processed, clean the chamber after each use.

⚠ Allow thermostatic traps to cool down to room temperature before removing cover. Since there is nothing to limit expansion, the bellows may rupture or fatigue if trap is opened while hot.

⚠ Actuation at less than 75% of rated pressure can allow debris to contaminate the seat and cause the safety valve to leak. A leaking safety valve must be replaced.

⚠ Insufficient service clearance will make repairs more difficult and time-consuming.

⚠ Piping sized too small may cause water hammer, resulting in damage to the sterilizer.

⚠ After installation, it is mandatory to brace piping at the drain funnel so that it will not move vertically.

⚠ Make sure door opening is clear of any obstruction before closing the door(s).

⚠ Do not attempt to open sterilizer door during manual operation unless chamber is at 0 psig.

⚠ During manual operation, gasket must be fully retracted prior to operating sterilizer door.

⚠ Immediately wipe up saline solution spills on loading car, to prevent damage to stainless steel

Section 2: Installation Verification

An Equipment Drawing showing all utility and space requirements is supplied with each sterilizer. Clearance space shown on the drawing is necessary for ease of installation and to assure proper operation and maintenance of equipment.

2.1 Installation Check List

After installing this unit according to the instructions provided, complete the following checklist to assure that your installation is complete and correct. Or, if you desire, contact EGIC for a technician to be scheduled to test your installation and demonstrate proper equipment operation

2.1.1 Service Clearance

⚠Caution: Insufficient Service Clearance will make repairs more difficult and time consuming

Clearance as specified on the equipment drawing must be available.

2.1.2 Plumbing Services

⚠Caution: Piping sized too small may cause water hammer, resulting in damage to the Sterilizer.

➢**Feed Water**:

- All supply line shutoffs must be provided with lockout capability.
- **Water Pressure** specification is [1.4 to 3.5 bar], dynamic). Water pressure supplied must be within specifications as shown on the Equipment Drawing. If pressure is too high, a regulator must be installed. If water pressure is too low, equipment performance will be affected.
- **Water Quality** supplied must be within specifications. Improper water quality adversely affects equipment operation. **Damage to the equipment due to improper water quality is not covered under warranty.**

➢**Drain Piping** must be sloped properly, and sized to handle the maximum waste flow from the sterilizer.

⚠Caution: After installation, it is mandatory to brace piping at the drain funnel so it will not move vertically.

➢Electric single-phase service to the unit must be as specified on the Equipment Drawing and on the Machine Data Plate.

2.1.3 Electrical Service

- The protective earth ground must be connected to sterilizer.
- Three-phase power for vacuum pump must meet specifications on the equipment drawing.
- Verify proper rotation of the vacuum pump by observing pump rotor shaft.
- 3-phase service requires a clearly marked disconnect with lockout/tagout capability located near the sterilizer.

2.1.4 Sterilizer Final Check

- Chamber leveled properly.
- Door opens and closes smoothly.
- Door locked switches adjusted correctly.
- Chamber strainer in place.
- Rack and shelves and/or loading car operates correctly.
- Paper loaded in printer.

2.1.5 Cycle Operation

⚠WARNING- EXPLOSION HAZARD: EGIC Sterilizers are not designed to process flammable compounds.

- Unit powers up correctly.
- Run Leak Test cycle – leak rate is to be less than 1.0 mm Hg/minute (1.3 mbar/min).
- Verify operation of a typical cycle (Prevacuum,132° C).

2.2 Technical Specifications

2.2.1 Over all Exterior Dimensions, mm

Model	SD/DD	W	L	H
EGESTER 40	SD	650	1000	1900
EGESTER 40	DD	650	1100	1900
EGESTER 50	SD	850	1100	1900
EGESTER 50	DD	850	1200	1900
EGESTER 60	SD	1000	1100	1900
EGESTER 60	DD	1000	1200	1900
EGESTER 70	SD	1100	1400	1900
EGESTER 70	DD	1100	1500	1900

2.2.2 Weight, Fully Loaded

- EGESTER 40, 750 kg.
- EGESTER 50, 1000 kg.
- EGESTER 60, 1900 kg.
- EGESTER 70, 2300 kg.

2.2.3 Capacity

- EGESTER 40, 160 Ltr.
- EGESTER 50, 280 Ltr.
- EGESTER 60, 400 Ltr.
- EGESTER 70, 670 Ltr.

2.2.4 Utility Requirements

- Electric:
  - Controls: 220V, 4A, 1 Phase.
  - Vacuum Pump: 380V, 3A, 3 Phase.
- Water:
  - Pressure: 1.4 to 3.5 bar.
  - Temperature: 21°C maximum.
  - Consumption: 57 lpm, Peak.
- Steam:
  - Pressure: 3.5 to 5.2 bar.
  - Consumption:
    - EGSTER 40: 45 kg/hr.
    - EGSTER 50: 60 kg/hr.
    - EGSTER 60: 90 kg/hr.
    - EGSTER 70: 150 kg/hr.
- Compressed Air:
  - (5:8 bars) Filtered Regulated Air Supply.

2.2.5 Environmental Conditions

- Temperature: 10 to 32°C.
- Humidity: 10% to 90% noncondensing.
- Pollution degree: 2.
- Over Voltage Category: II
- A-Weighted Sound Power Level: ≤ 85 dBA (maximum).

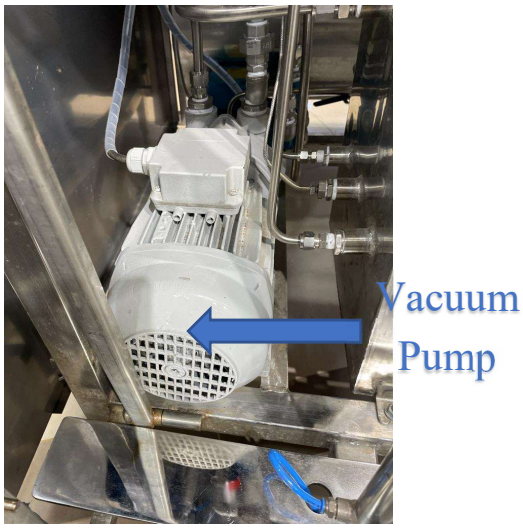
Section 3: Component Identification

Steam Generator

- 316 stainless steel, unique design to achieve maximum efficiency with minimum power consumption.
- Equipped with manual flush and drain package.
- Mechanical and electrical safety features.

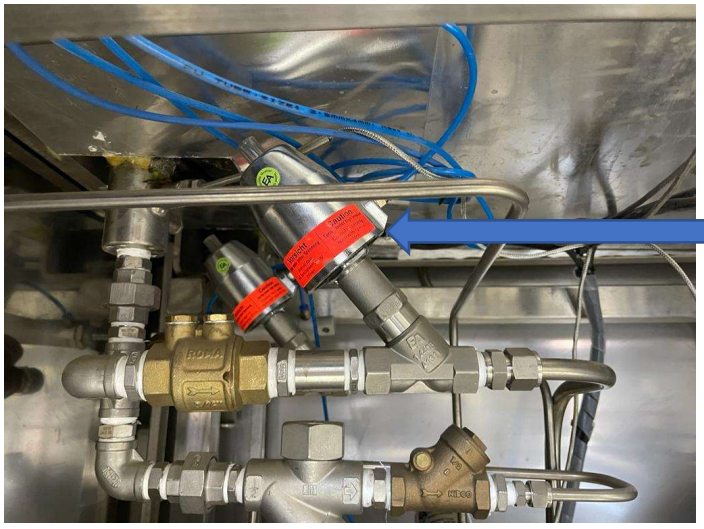
Vacuum Pump

- The machine is equipped with high end vacuum pump to achieve the required vacuum and dry characteristics.



Pneumatic Valves

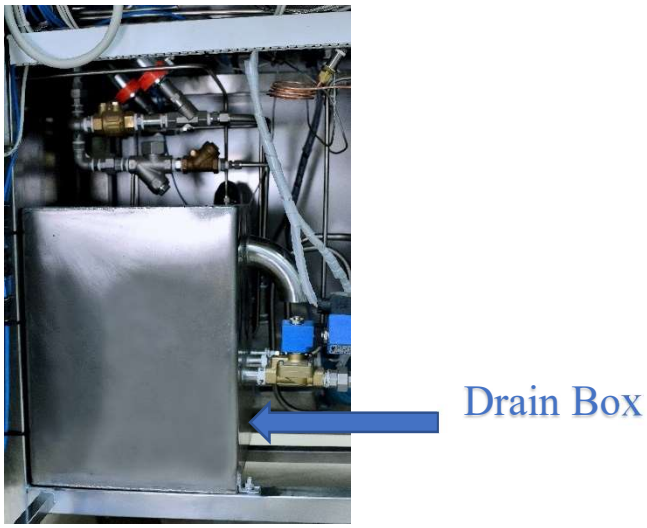
- All Steam Supply lines are equipped with high quality Pneumatic Valves Made from high end materials with metal body to achieve high reliability.



Drain Box

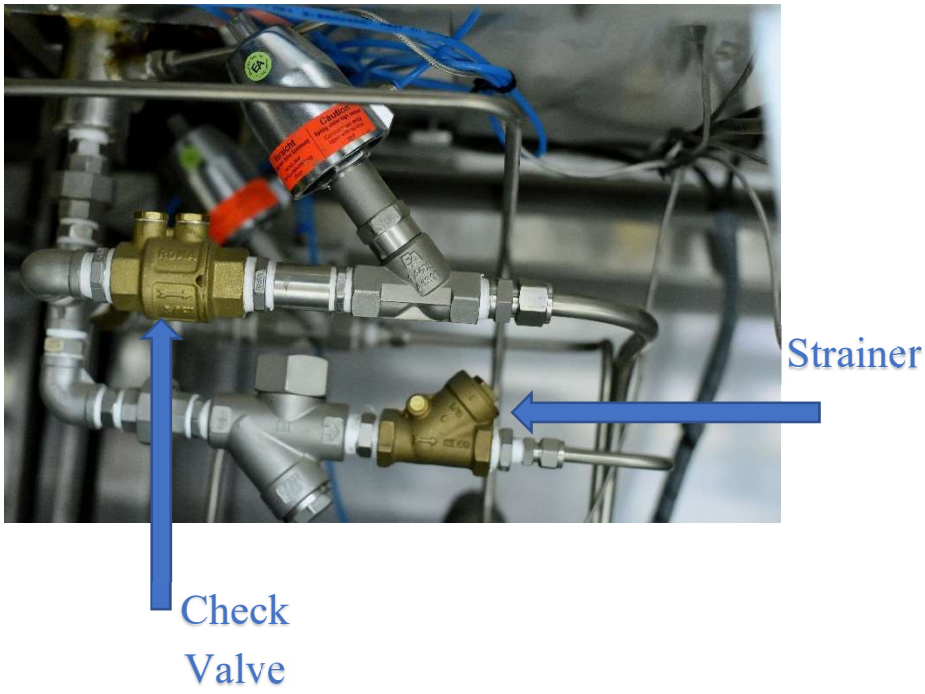
- Stainless steel drain box with built in heat exchanger.

- Waste Temperature is controlled by an RTD in closed loop with the control system to minimize water consumption.



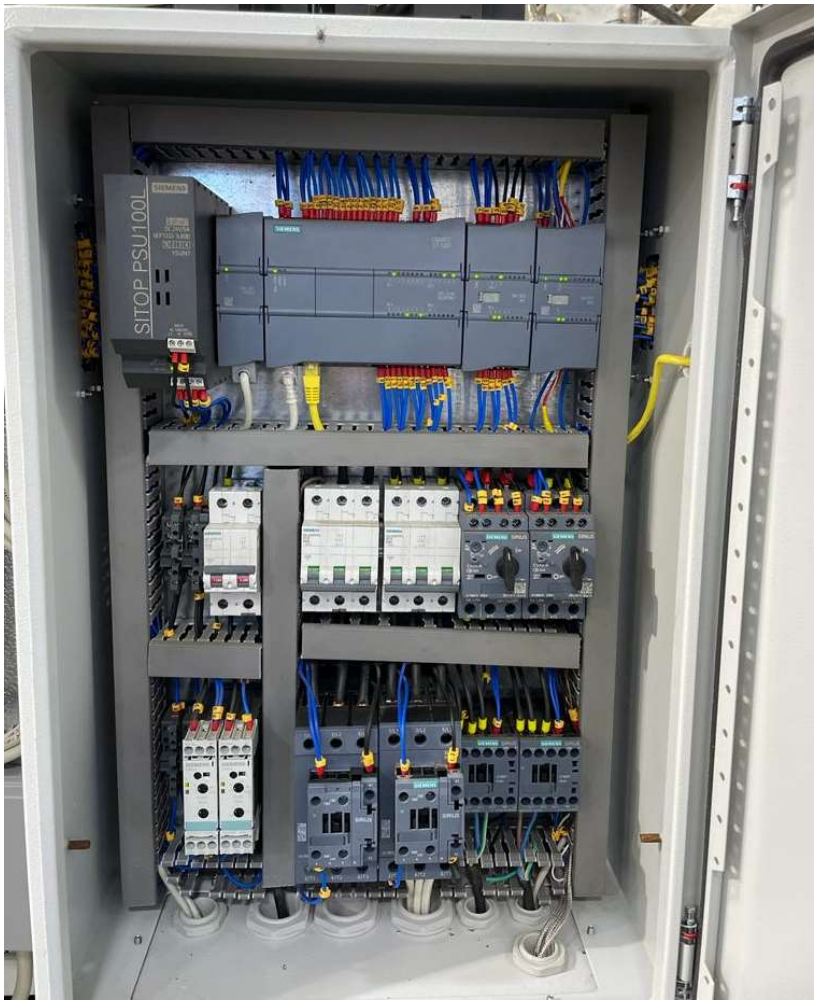
Check Valves & Strainers

- Fitted where necessary to ensure proper and save operation.



Control Panel

- All components are manufactured by SIEMENS, that includes Circuit Breakers Overloads, Contactors, Level Monitoring Relays, Power Supply and the Efficient highly reliable S7- 1200 Programmable Logic controller (PLC), to ensure smooth, save and efficient operation.



Section 4: Sterilizer Operation

4.1 Preparing Loads for sterilization cycles

Before sterilization, all materials must be thoroughly cleaned.

EGIC Steam Sterilizers chamber holds commonly used wrapped or unwrapped instruments and equipment.

1. Wrappers may be made of 100% cotton, 140 thread count, two-ply fabric, and must be laundered; alternatively, use commercially available, non- woven disposable wrappers.

2. Limit the size and density of each muslin pack. [Maximum size: 305 x 305 x 508 mm; Maximum weight: 5.4 kg. No pack should have a density in excess of 115 kg/m3. This ensures complete steam penetration, and minimizes moisture retention.

3. Limit the weight of wrapped instrument sets to 7.7 kg to minimize moisture retention.

4. Limit the weight of basin sets to 3.2 kg

4.2 Guidelines for Placement of Various Loads

⚠WARNING- BURN HAZARD: Sterilizer, rack/ shelves and loading car will be hot after cycle is run. Always wear protective gloves and apron when re- moving a processed load. Protective gloves and apron must be worn when reloading sterilizer following the previous operation.

Refer to AAMI ST-46 for load placement guidelines.

1. Open the sterilizer chamber door.

   NOTE: If a cycle has been run, sterilizer and shelves or loading car may be hot.

   NOTE: Wear clean gloves and use clean towels as "pot holders" when carefully placing the load/tray(s) on the chamber shelves or loading car.

2. Place all packs on edge, and arrange load to allow for maximum steam exposure so that there is minimal resistance for steam passage through the load.

3. Place utensils and treatment trays on their edges so that they will be sterilized and properly dried.

4. Place instrument sets in trays that have a perforated or mesh bottom. Place flat for sterilization.

5. In mixed loads of fabrics and hard goods, place the hard goods on lower shelf. This reduces wetting of fabric packs from condensate dripping from a hard goods load.

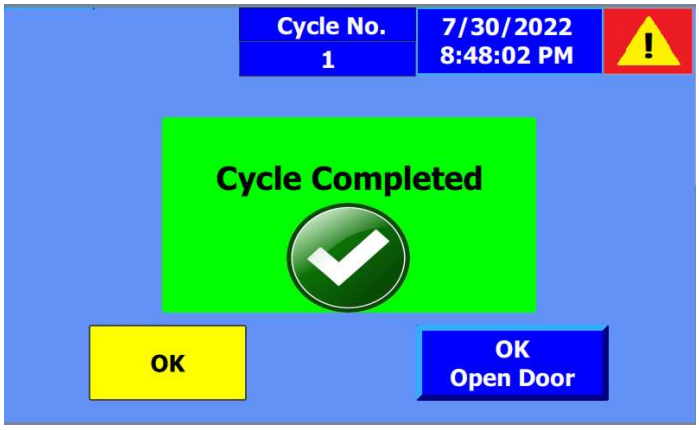
6. DO NOT OVERLOAD STERILIZER. Allow for steam penetration between packs. Avoid contact of load components with the wall of the chamber.

⚠WARNING- PERSONAL INJURY HAZORD: When closing the chamber door, keep hands and arms out of the door opening and make sure opening is clear of any obstructions.

7. After placing load in chamber, close the chamber door. The sterilizer is now ready to run a cycle.

8. Materials capable of holding water, such as solid-bottomed pans, basins and trays, should be positioned so that they are oriented in the same direction and so that condensate can be eliminated.

At the end of a cycle, the display shows:



Open the sterilizer chamber door.

NOTE: Wear clean gloves and use clean towels as "pot holders" when carefully removing load/tray(s) from the sterilizer shelves or loading car.

4.3 Unloading the sterilizer

⚠WARNING- BURN HAZARD: Sterilizer, rack/ shelves and loading car will be hot after cycle is run. Always wear protective gloves and apron when re- moving a processed load. Protective gloves and apron must be worn when reloading sterilizer following the previous operation.

⚠WARNING- BURN

HAZARD: Steam may be released from the chamber when door is opened. Step back from the sterilizer each time the door is opened to minimize contact with steam vapor.

⚠WARNING- SLIPPING

HAZARD: To prevent falls, keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

NOTE: Never place a sterilized tray on a solid shelf or cold surface. Once the tray has cooled, it can be placed on a wire shelf.

1. Remove the load from chamber shelf (shelves). Avoid unnecessary handling.

2. Visually check outside wrapper for dryness. If there are water droplets or visible moisture on the exterior of the package, or on the tape used to secure it, the pack or instrument tray is considered unacceptable.

3. To prevent condensation, transfer the load to a surface which is well- padded with fabric. Do not place load on a cold surface. Be sure that no air conditioning or cold air vents are in close proximity.

4. Remove packs or instrument trays from the padded surface when they have reached ambient (room) temperature. Depending on the items and environment of the area, this may take a minimum of 1 hour.

Important: After removing load(s) from the chamber, close the chamber door and keep the chamber door closed to minimize utility consumption.

4.4 Guidelines Loading/ Unloading sterilizer: Rack

If sterilizer is equipped with the rack and shelves option, refer to

⚠WARNING- BURN

HAZARD: Sterilizer, rack/ shelves and loading car will be hot after cycle is run. Always wear protective gloves and apron when re- moving a processed load. Protective gloves and apron must be worn when reloading sterilizer following the previous operation.

If sterilizer is equipped with the rack and shelves option, refer to instructions and Figure below:

1. Open the sterilizer chamber door.

2. Place all packs on edge, and arrange load to allow for maximum steam exposure so that there is minimal resistance for steam passage through the load.

3. After loading the shelves, slide them to closed position to verify shelf does not interfere with door operation (both doors if double-door sterilizer).

4. Close chamber door(s).

⚠WARNING- BURN

HAZARD: Steam may be released from the chamber when door is opened. Step back from the sterilizer each time the door is opened to minimize contact with steam vapor.

⚠WARNING- SLIPPING

HAZARD: To prevent falls, keep floors dry by immediately wiping up any spilled liquids or condensation in sterilizer loading or unloading area.

5. The sterilizer is now ready to run a cycle. Refer to appropriate cycle description.

6. Following successful completion of the sterilization cycle, unload the sterilizer as follows:

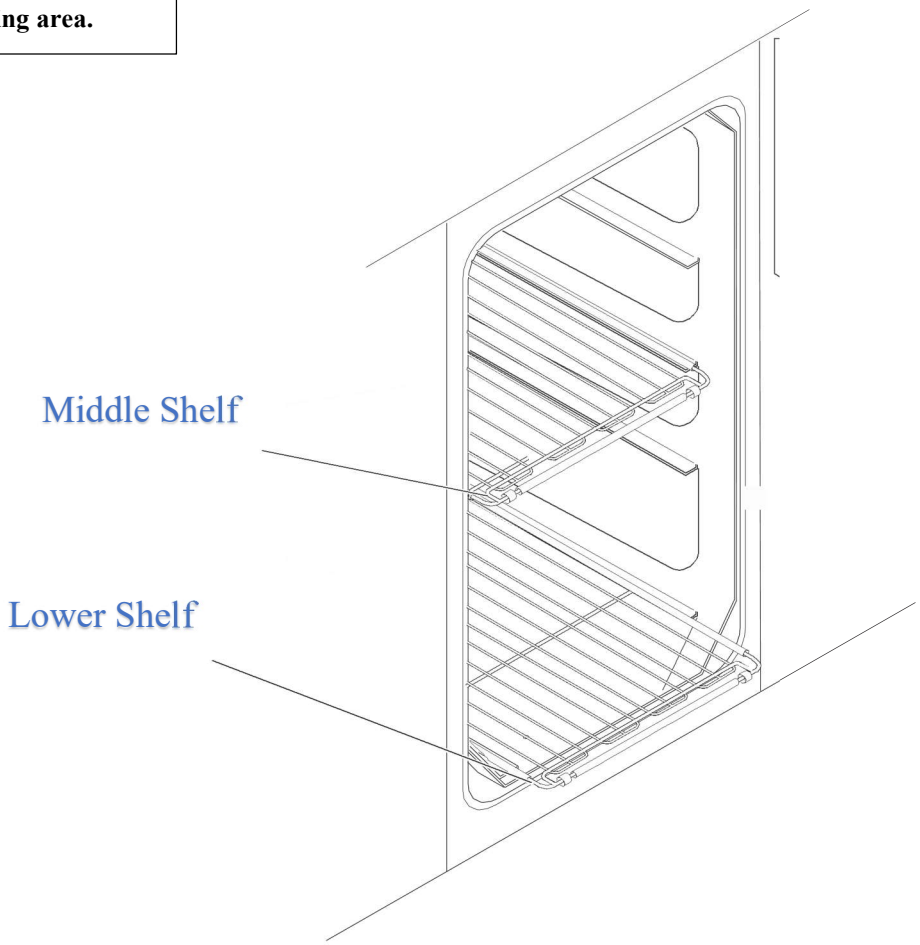
a. Open chamber door.

b. Remove load from chamber.

c. Slide shelves into chamber, verifying that position does not interfere with door operation.

d. Close chamber doors.

e. Transfer load to destination



Section 5: Cycles and Phases

5.1 Factory Set Cycles

EGIC Prevacuum Steam Sterilizers are shipped with factory-set cycles and cycle values listed in the following Tables:

Cycle	Sterilize Temp.	Sterilize Time	Dry Time	Recommended Load	Validation Standard
PREVAC.	132°C	4 MIN	20 MIN	Double-wrapped instrument trays	ST-8
PREVAC.	121°C	15 MIN	20 MIN	Full Load Fabric Packs	ST-8
EXPRESS	132°C	10 MIN	4 MIN	Single Wrapped Instrument Tray	ST-8
Flash	132°C	10 MIN	1 MIN	Unwrapped non-porous Instrument Tray	ST-8
GRAVITY	132°C	15 MIN	30 MIN	Full Load Instrument Trays	ST-8
GRAVITY	121°C	30 MIN	15 MIN	Full Load Fabric Packs	ST-8
PREVAC	134°C	3 MIN	16 MIN	Full Load Instrument Trays	ST-8
PREVAC	132°C	4 MIN	5 MIN	Single Fabric Pack	ST-8

Table. Factory-Set Operating Cycles.

Test Cycle	Sterilize Temp.	Sterilize Time	Dry Time	Recommended Load	Validation Standard
Warm Up	132°C	3 MIN	1 MIN		N/A
Bowie-Dick Test	132°C	3-1/2 MIN.	1 MIN	DART or Bowie-Dick Test Pack	ST-8
Leak Test	132°C	N/A	N/A	N/A	ST-8

Table. Factory-Set Test Cycles.

The sterilization cycles listed in the previous Tables have been validated using techniques documented in AAMI ST-8. If different cycle parameters (sterilize time and dry time only) other than those Listed in Tables are required, it is the responsibility of the healthcare facility to validate the cycle. Reference AAMI guidelines/standards for a guide to validating sterilization cycles and to ensure that proper sterility assurance level (SAL) as well as moisture retention acceptance criteria are met.

5.2 GRAVITY/ FLASH Cycle

NOTE: Components shown in parentheses () denote components used only on double door sterilizers.

NOTE: S4 and S9 will be intermittent while controlling the temperature of the waste water and jacket throughout the cycle.

Jacket Temperature – Out of cycle

The jacket is maintained at the temperature the previous cycle was run On.

Activate Seal(s)

Steam enters the door seal, pressing it against inside surface of the door.

S37 (38) will be deenergized and S35 (36) will be energized. When the pressure behind the seal reaches 10 psig and after a 5 second delay, the cycle will advance to the Purge phase.

Purge

Chamber is purged with steam.

S2 (Steam to Chamber), S3 (Fast Exhaust), S4 (Cooling Water), and S35 (36) will be on.

Charge

Chamber is charged with steam. Start of steam charge is printed.

S3 and S4 will go off. S2 and S35 (36) will be on.

Sterilize

Start of sterilize exposure is printed when the chamber reaches sterilization temperature. Chamber temperature is printed every minute.

S35 (36) will remain on, S2 will be intermittent while controlling Chamber temperature Wait until sterilize time reaches 0:0.

Fast Exhaust

S2 will go off. S4, S40 and S35 (36) will be on. Wait until display shows 4 psig.

Dry

S4, S40 will go off. S3, S7 and S35 (36) will be on.

Air Break

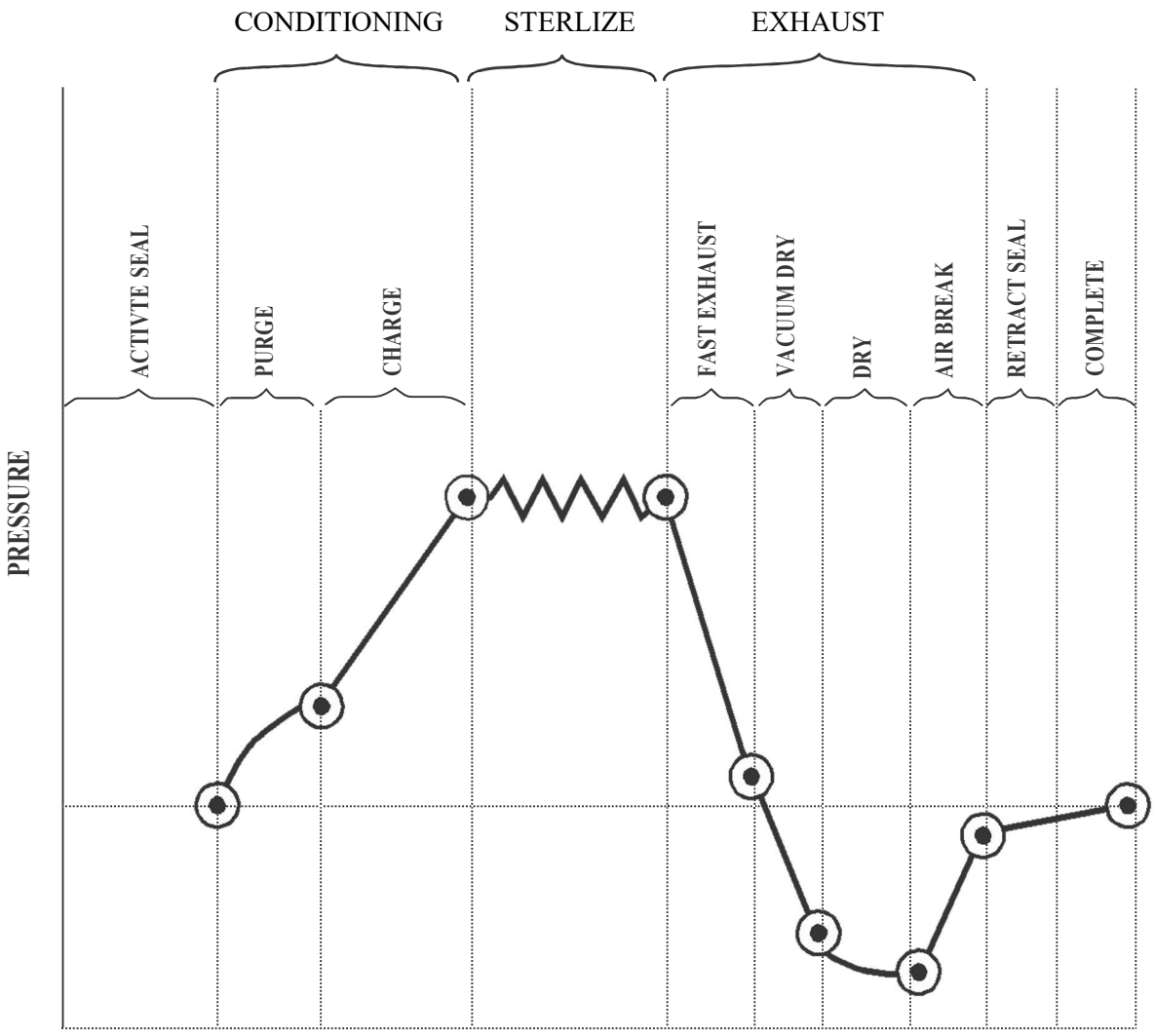
S3, S7 will go off. S1, S35 (36) will be on.

Retract Seals

Sl will remain on. S35 (36) will turn off. S7, S37 (38) will turn on. After the seal pressure switch opens (less than 10 psig), S7 will turn on, a vacuum will be pulled for an additional 18 seconds.

Complete

S37 (38) will be on. S4 will be intermittent. S9 will maintain jacket temperature, all others will be off. A summary of the values attained during the cycle will be printed.



⊙INDICATES KEY CYCLE TRANSITION POINTS THAT ARE PRINTED DURING CYCLE

Figure. Cycle Graph – GRAVITY Cycle.

5.3 PREVAC/ EXPRESS/ BOWIE-DICK Cycle

NOTE: Components shown in parentheses () denote components used only on double door sterilizers.

NOTE: S4 and S9 will be intermittent while controlling the temperature of the waste water and jacket throughout the cycle.

Jacket Temperature – Out of cycle

The jacket is maintained at the temperature the previous cycle was run On.

Activate Seal(s)

Steam enters the door seal, pressing it against inside surface of the door.

S37 (38) will be deenergized and S35 (36) will be energized. When the pressure behind the seal reaches 10 psig and after a 5 second delay, the cycle will advance to the Purge phase.

Purge

Chamber is purged with steam.

S2 (Steam to Chamber), S3 (Fast Exhaust), S4 (Cooling Water), and S35 (36) will be on.

Vacuum Pulse

The chamber is evacuated from residual air.

S2 turns off. After 4 psig is reached, S4 will turn off and S7 will turn on. A vacuum will be pulled on the chamber for until 10 inHg is reached. After the last vacuum pulse, the cycle will advance to the Charge phase.

Pressure Pulse

S3 turns off. S2, S9 and S35 (36) will be on. Wait until the pressure reaches 26 psig. Vacuum pulse will repeat. (2 pulses for Express, 4 pulses for PREVAC and BOWIE-DICK cycles.)

Charge

Chamber is charged with steam. Start of steam charge is printed.

S3 and S4 will go off. S2 and S35 (36) will be on.

Sterilize

Start of sterilize exposure is printed when the chamber reaches sterilization temperature. Chamber temperature is printed every minute.

S35 (36) will remain on, S2 will be intermittent while controlling Chamber temperature Wait until sterilize time reaches 0:0.

Fast Exhaust

S2 will go off. S4, S40 and S35 (36) will be on. Wait until display shows 4 psig.

Dry

S4, S40 will go off. S3, S7 and S35 (36) will be on.

Air Break

S3, S7 will go off. S1, S35 (36) will be on.

Retract Seals

Sl will remain on. S35 (36) will turn off. S7, S37 (38) will turn on. After the seal pressure switch opens (less than 10 psig), S7 will turn on, a vacuum will be pulled for an additional 18 seconds.

Complete

S37 (38) will be on. S4 will be intermittent. S9 will maintain jacket temperature, all others will be off. A summary of the values attained during the cycle will be printed.

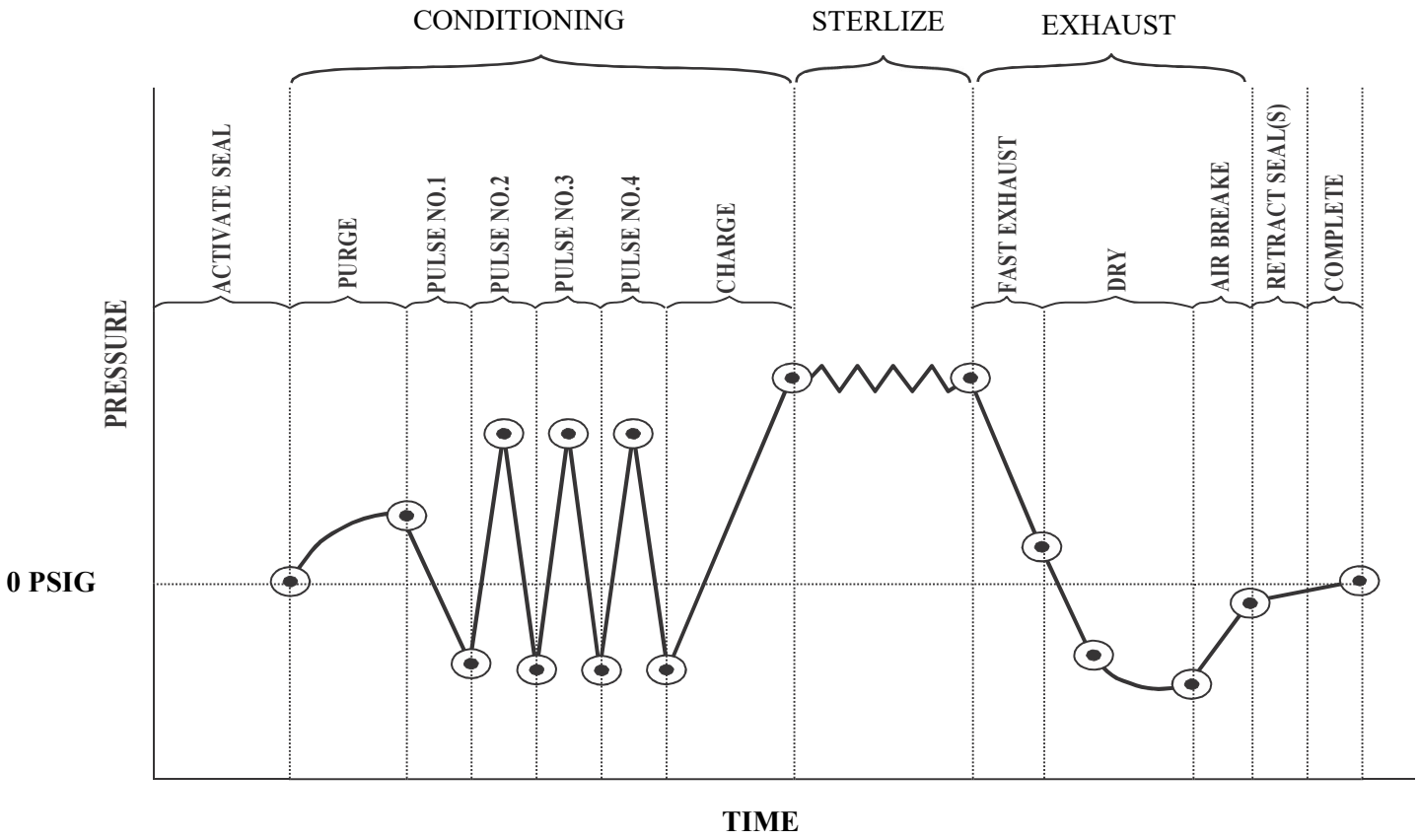


Figure. Cycle Graph – PREVAC/ EXPRESS and Bowie-Dick.

5.4 Leak Test

NOTE: Components shown in parentheses () denote components used only on double door sterilizers.

NOTE: S4 and S9 will be intermittent while controlling the temperature of the waste water and jacket throughout the cycle.

Activate Seal(s)

Steam enters the door seal, pressing it against inside surface of the door.

S37 (38) will be deenergized and S35 (36) will be energized. When the pressure behind the seal reaches 10 psig and after a 5 second delay, the cycle will advance to the Purge phase.

Purge

Chamber is purged with steam.

S2, S3, S4, and S35 (36) will be on.

Vacuum Pulse

The chamber is evacuated from residual air.

S2 turns off. After 4 psig is reached, S4 will turn off and S7 will turn on. A vacuum will be pulled on the chamber for until 10 inHg is reached. After the last vacuum pulse, the cycle will advance to the Charge phase.

Pressure Pulse

S3 turns off. S2, S9 and S35 (36) will be on. Wait until the pressure reaches 26 psig. Vacuum pulse will repeat.

Charge

Chamber is charged with steam. Start of steam charge is printed.

S3 and S4 will go off. S2 and S35 (36) will be on.

Leak Test Evacuating

S2 will turn off. S3, S4 and S35 (36) will be on until 4psig is reached. Then S4 turns off and S7 turns on. Wait for 10 minutes.

NOTE: If 20 inHg is not reached in 10 minutes, the Leak Test is aborted because of insufficient vacuum. The leak must be fixed and Leak Test repeated.

Fast Exhaust

S2 will go off. S4, S40 and S35 (36) will be on. Wait until display shows 4 psig.

Leak Test Stabilizing

S3 will turn off. The chamber will stabilize for 2 minutes before starting the leak test count down.

Leak Test

The sterilizer will time for 10 minutes. At the end of 10 minutes Sl will turn on.

Air Brake

S3, S7 will go off. S1, S35 (36) will be on.

Retract Seals

Sl will remain on. S35 (36) will turn off. S7, S37 (38) will turn on. After the seal pressure switch opens (less than 10 psig), S7 will turn on, a vacuum will be pulled for an additional 18 seconds.

Complete

S37 (38) will be on. S4 will be intermittent. S9 will maintain jacket temperature, all others will be off. A summary of the values attained during the cycle will be printed

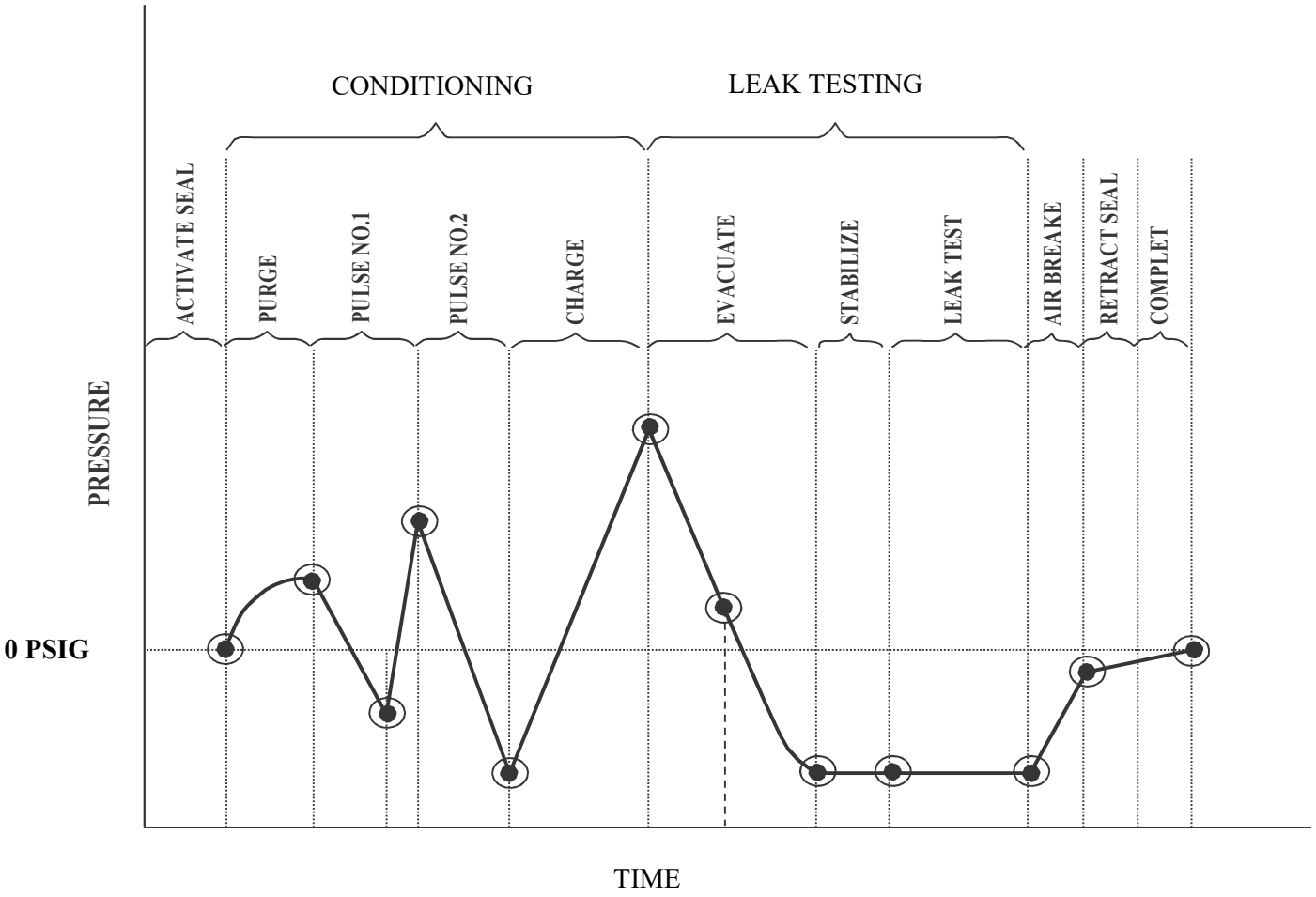


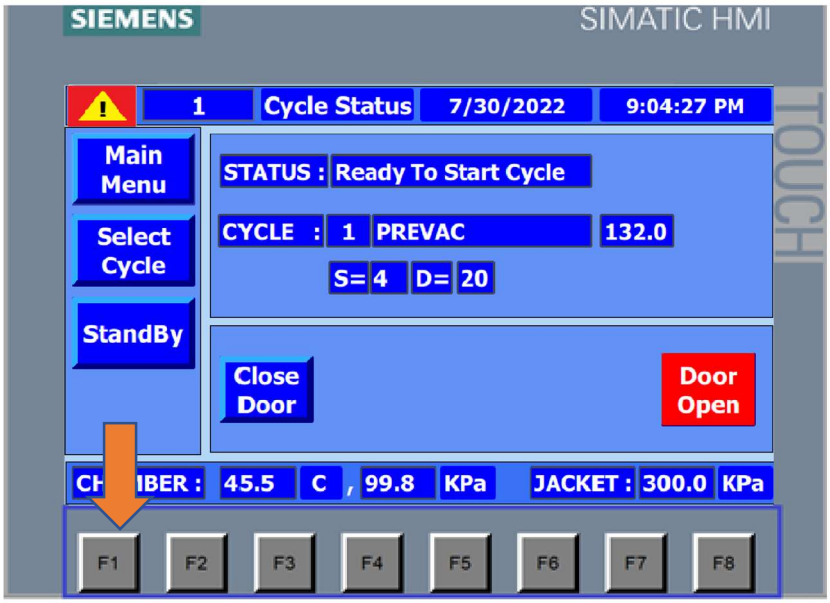
Figure. Cycle Graph – Leak Test

Section 6: Cycle and control values programming

6.1 Cycle Selection

Method 1:

- Click the system Function Key on your screen labeled (**F1: F8**) from any page.
- Each Function Key Corresponds to the matching cycle number Ex. (F1…. Cycle1, F2…. Cycle2, etc.).
- After clicking any function key, the corresponding cycle will be selected and the Cycle Status Page will be displayed.



Method 2:

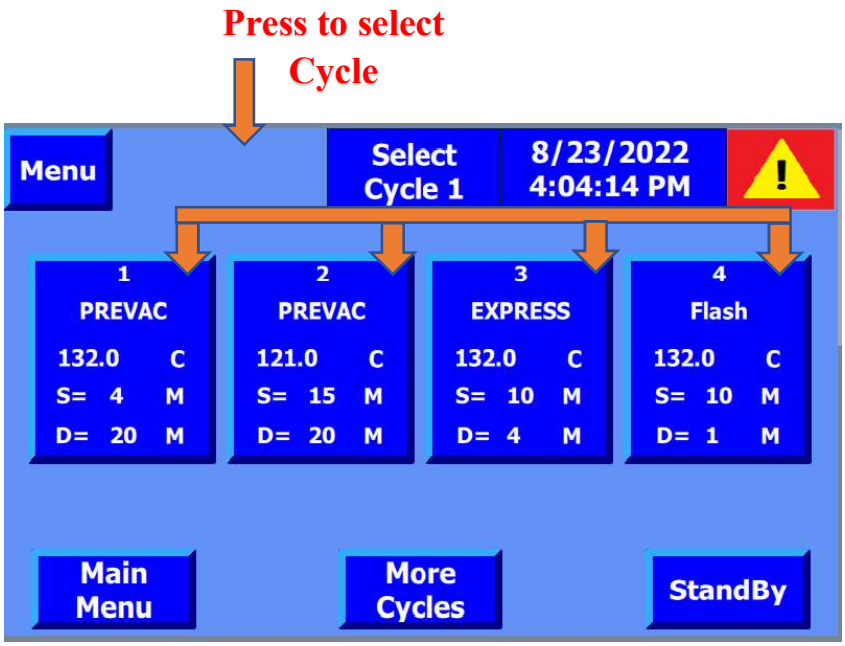
A. Click the Main Menu Icon 

from any page. the Home Screen Page will be displayed.

B. Click the Select Cycle Icon 

, the Select Cycle Page will be displayed.

C. Choose the required cycle from the list.



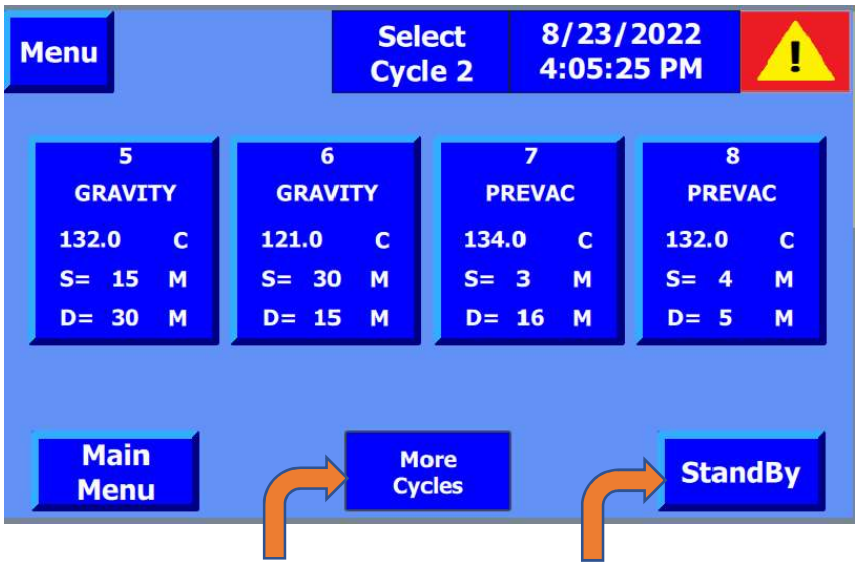
D. Use 

Icon to view more cycles.

E. Use 

Icon to enter Standby Mode, the steam generator will stop until you press 

Button.

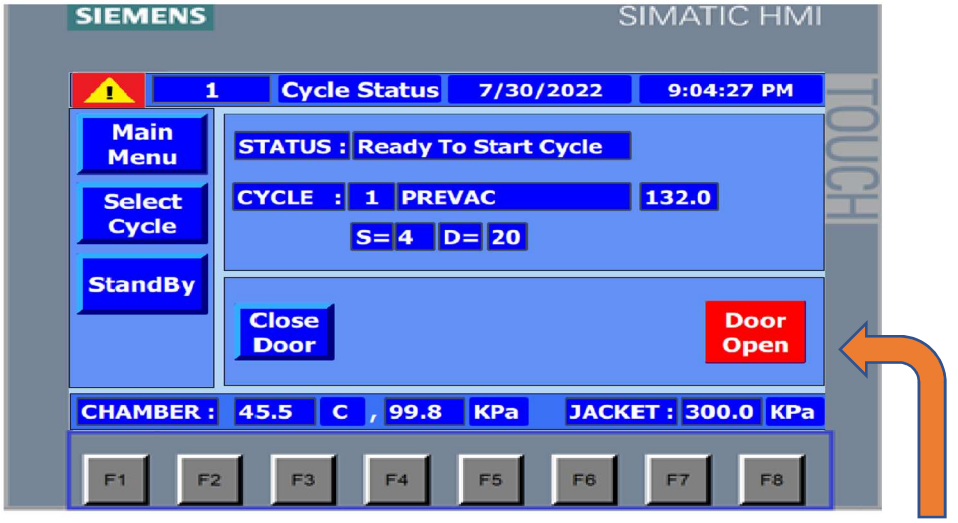


6.2 Starting the Cycle

1.Select a cycle as shown previously.

2.Close the door(s).

3.Wait for the Jacket to be charged.

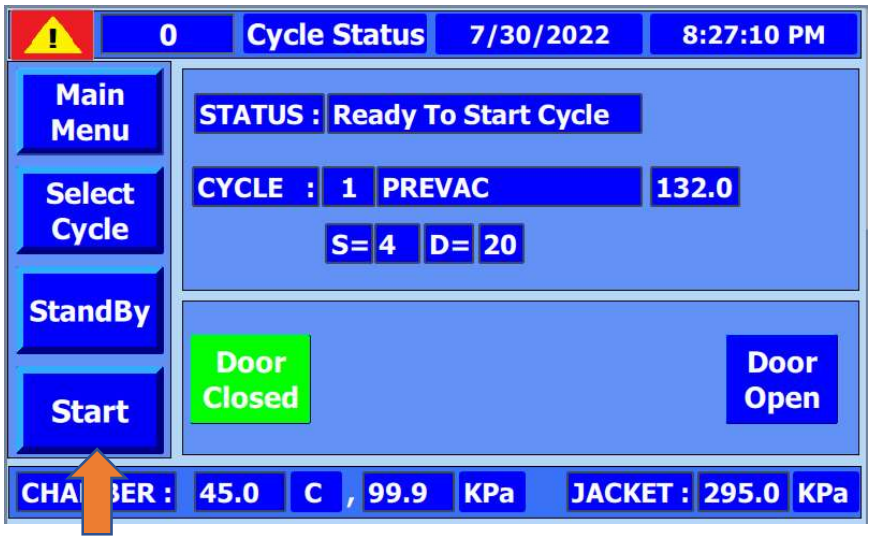


Door is Open

✓ The system automatically charges the jacket to the required Temperature based on the sterilization temp. of the chosen cycle it then displays the 

Icon.

4. Press Start Button to start the cycle.

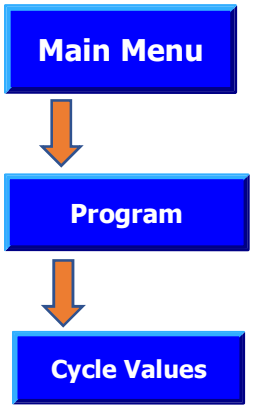


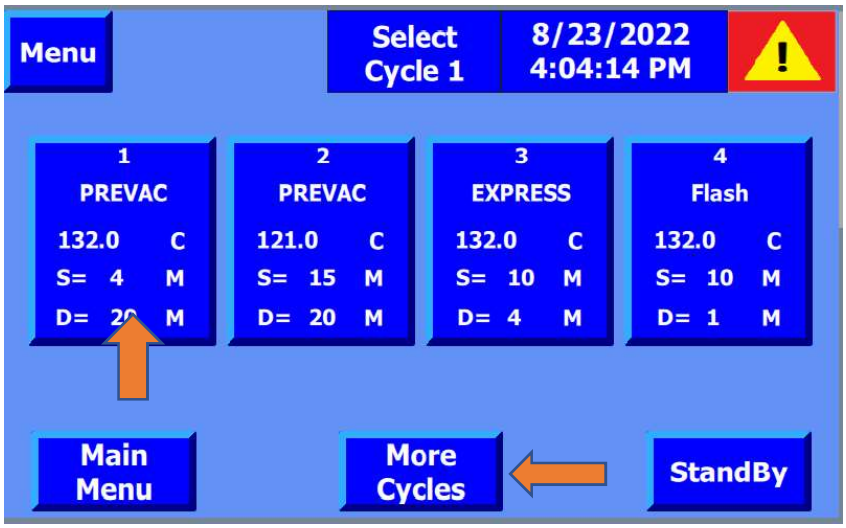
Press to Start the cycle

Note: If (System Ready, Door Closed) icons are shown and the Start icon doesn't appear on the screen refer to **SECTION 7** of this manual to check and correct present alarm(s).

6.3 Change Cycle Parameters

A. Navigate to Cycle Values Page by clicking





Press to Change Dry Time

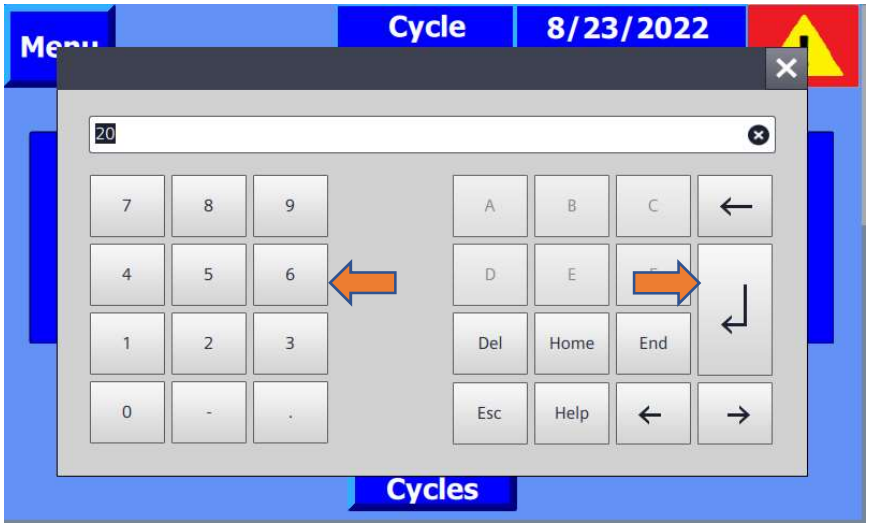
Press For More Cycles

B. Click the parameter to be changed as shown a pop-up menu will appear.

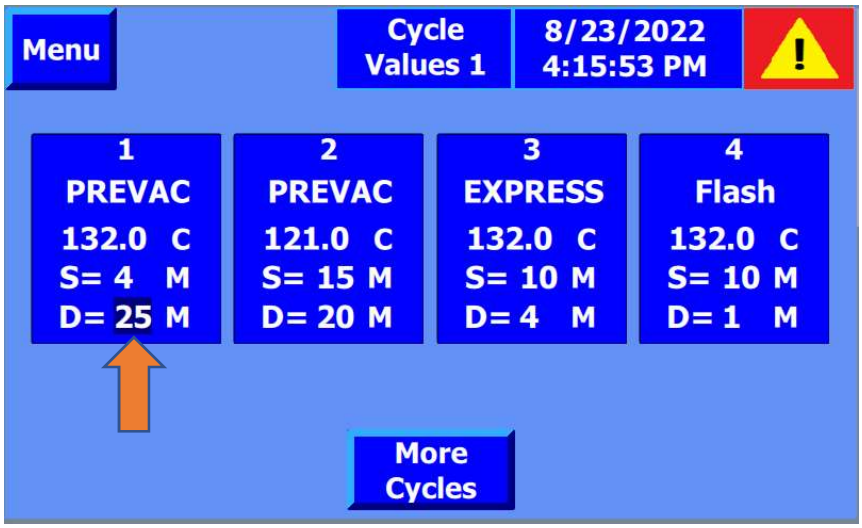
C. Use the keypad to enter the new value then.

D. press  button to save.

.



E. The value will be changed as shown, this value is now retained in PLC memory.



Section 7: Troubleshooting

⚠WARNING- PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Repairs and adjustment to EGIC equipment must be made only by fully qualified service personnel. Maintenance performed by in-experienced, unqualified persons or installation unauthorized parts could cause personal injury or result in costly equipment damage

⚠WARNING- SHOCK HAZARD: Disconnect all utilities to sterilizer before servicing. Always follow OSHA Lockout-Tagout and electrical safety-related work practice standards. (See CFR1910.147 and .331 through.335.)

This section lists and describes all the possible alarm conditions which may occur when operating EGIC Steam Sterilizers.

If a problem occurs that is not described in this section, please call EGIC®. A trained service technician will promptly place your sterilizer in proper working condition.

NOTE: Never permit unqualified persons to service the sterilizer.

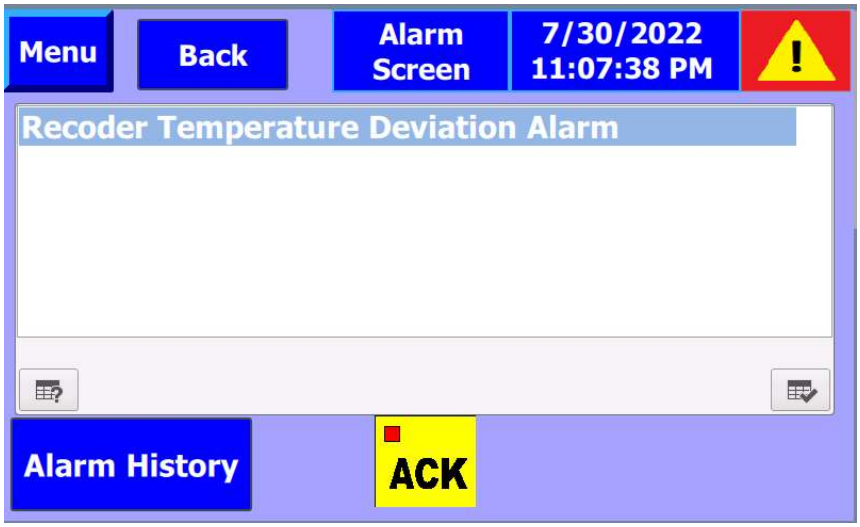
WARNING–BURN HAZARD: Allow sterilizer to cool to room temperature before performing any cleaning or maintenance procedures.

7.1 Alarm Screen

When an alarm occurs during the cycle the system automatically activates Emergency Protocol to evacuate the chamber and release its pressure.

You can view any existing alarm by entering the alarm screen.

1. Click the  to view the Alarm Screen.
2. Check the present alarm(s) and correct them.
3. Click the  icon to return to Cycle Status Page.



7.2 Alarm List, Causes and procedure

Alarm	Description	Causes and Correction
Error1	PLC Software Error	❖ Occurs main controller malfunction. ✓ Contact EGIC for a Service Visit.
Error2	Air Pressure Too Low	❖ Occurs if air pressure is below the set value. 1. Main Air Valve is closed. ✓ Check the valve is open. 2. Air pressure switch Malfunction. ✓ Check Pressure Switch Setting, Readjust.
Error3	Sterilization Pressure Limit Exceeded	❖ Occurs if chamber Pressure exceeds the maximum sterilize Pressure (Control Press. + over press. value). 1. Steam Pressure is More than 50 psig. ✓ Check Steam Generator Pressure Switch Setting. 2. Solenoid Valve Leak. ✓ Check S2. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error4	Sterilization Temperature Is Out of Range (120:124), (130:136)	❖ Occurs if the chosen cycle sterilization temperature is out of allowed range. 1. Correct cycle parameter, Temperature.
Error5	Sterilization Maximum Attempts Is Reached	❖ Occurs if chamber temperature drops below cycle sterilization temperature. 2. Steam Pressure is less than 50 psig. ✓ Check Steam supply Valve is open. 3. Chamber Steam Trap Malfunction: ✓ Repair. 4. Control Out of Calibration. ✓ Contact EGIC for a Service Visit. 5. Solenoid Valve Malfunction: ✓ Check S9, S2 are working. 6. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.

Alarm	Description	Causes and Correction
Error6	**Pressure Temperature Curve Error, Temperature and Pressure Are Out of Range**	❖ **Occurs if chamber pressure and temperature readings are outside the normal steam range during sterilize phase.** **1. Control Out of Calibration.** **2. Pressure Transducer Malfunction.** **3. Chamber RTD Malfunction.** **✓ Contact EGIC for a Service Visit.**
Error7	Sterilization Maximum Temperature Exceeded	❖ Occurs if chamber temperature exceeds the maximum sterilize temperature (Control temp. + over temp. value). 4. Steam Pressure is More than 50 psig. ✓ Check Steam Generator Pressure Switch Setting. 5. Solenoid Valve Leak. ✓ Check S2. 6. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error8	Chamber Temperature Is Too High	❖ Occurs if chamber temperature exceeds the maximum Set value. 1. Steam Pressure is More than 50 psig. ✓ Check Steam Generator Pressure Switch Setting. 2. Solenoid Valve Leak. ✓ Check S2. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error9	**Vacuum Pulse Minimum InHg Can't Be Achieved**	❖ **Occurs if chamber does not reach the set vacuum value within the allotted time.** **1. Vacuum Pump Malfunction.** **✓ Check Vacuum Pump is working.** **2. Solenoid Valve Malfunction.** **✓ Check S2, S1 is not leaking.** **✓ Check S7 is Working.** **3. Water Pressure is low.** **✓ Check water supply valve is open.** **4. Control Out of Calibration.** **✓ Contact EGIC for a Service Visit.**

Alarm	Description	Causes and Correction
Error10	Pressure Pulse Is Taking Too Long	❖ Occurs if chamber Pressure during pressure pulse phase does not reach the set value within the allotted time. 1. Steam Pressure is less than 50 psig. ✓ Check Steam supply Valve is open. 2. Solenoid Valve Malfunction: ✓ Check S9, S2 are working. ✓ Check S3 is not leaking. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error12	Jacket Temperature Too High	❖ Occurs if Jacket temperature exceeds the maximum Set value. 1. Steam Pressure is More than 50 psig. ✓ Check Steam Generator Pressure Switch Setting. 2. Solenoid Valve Leak. ✓ Check S9. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error13	Jacket Temperature Too Low	❖ Occurs if Jacket temperature falls below the minimum Set value during Cycle. 1. Steam Pressure is Less than 50 psig. ✓ Check Steam Generator Pressure Switch Setting. ✓ Check Steam Generator is working properly. 2. Solenoid Valve Malfunction. ✓ Check S9 is working. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error14	Activate Seal Is Taking Too Long	❖ Occurs if seal does not reach 10 psig within allotted time. 1. Seal Pressure Switch Malfunction. ✓ Check Pressure Switch Setting, readjust. 2. Solenoid Valve Malfunction. ✓ Check S35 is open. ✓ Check S37 is not leaking.

Alarm	Description	Causes and Correction
Error15	Door 1 Pressure Switch Open.	❖ Occurs if steam pressure in door seal drops below 10 psig during cycle. 1. Seal Pressure Switch Malfunction. ✓ Check Pressure Switch Setting. 2. Solenoid Valve Malfunction. ✓ Check S35 is open. ✓ Check S37 is not leaking.
Error16	Door 2 Open	❖ Occurs if Door 2 limit switch opens during cycle. 1. Door Limit Switch Malfunction. ✓ Check, adjust Limit Switch.
Error18	Door 1 Open	❖ Occurs if Door limit switch opens during cycle. 2. Door Limit Switch Malfunction. ✓ Check, adjust Limit Switch.
Error19	Emergency Button Pressed	❖ Occurs if EMERGENCY button is Pressed 1. Unlock EMERGENCY button.
Error20	Charge Temperature Can't Be Achieved	❖ Occurs if chamber does not reach the set temperature within the allotted time. 1. Steam Pressure is less than 50 psig. ✓ Check Steam supply Valve is open. 2. Solenoid Valve Malfunction: ✓ Check S9, S2 are working. 3. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error21	Pressure Temperature Curve Error, Pressure Is Out of Range	❖ Occurs if chamber pressure and temperature readings are outside the normal steam range during sterilize phase. 1. Control Out of Calibration. 2. Pressure Transducer Malfunction. ✓ Contact EGIC for a Service Visit.
Error22	Pressure Temperature Curve Error, Temperature Is Out of Range	❖ Occurs if chamber pressure and temperature readings are outside the normal steam range during sterilize phase. 1. Control Out of Calibration. 2. Chamber RTD Malfunction. ✓ Contact EGIC for a Service Visit.

Alarm	Description	Causes and Correction
Error23	Retract Seal Is Taking Too Long	❖ Occurs if door switch does not open within the allotted time. 1. Seal Pressure Switch Malfunction. ✓ Check Pressure Switch Setting. 2. Solenoid Valve Malfunction. ✓ Check S35 not leaking. ✓ Check S37 is open.
Error24	PT100, Chamber Broken	❖ Occurs if Chamber temperature reading is outside the normal range. 1. Loose connection in probe wiring. ✓ Repair. 2. Probe Malfunction. ✓ Replace. Recalibrate.
Error25	PT100, Jacket Broken	❖ Occurs if Jacket temperature reading is outside the normal range. 1. Loose connection in probe wiring. ✓ Repair. 2. Probe Malfunction. ✓ Replace. ✓ Recalibrate.
Error26	Chamber Pressure Transducer Broken	❖ Occurs if Chamber Pressure reading is outside the normal range. 1. Loose connection in probe wiring. ✓ Repair. 2. Probe Malfunction. ✓ Replace. ✓ Recalibrate.
Error27	Overload, Water Pump	❖ Occurs if Water Pump draws more than the allowed current. 1. Readjust O.L2 in the control unit to ON position. 2. If it falls again ✓ Contact EGIC for a Service Visit.
Error28	Overload, Vacuum Pump	❖ Occurs if Water Pump draws more than the allowed current. 3. Readjust O.L1 in the control unit to ON position. 4. If it falls again ✓ Contact EGIC for a Service Visit.

Alarm	Description	Causes and Correction
Error29	Water Pressure Too Low	❖ Occurs if Water pressure is below the set value. 1. Main Water Valve is closed. ✓ Check the valve is open. 2. Water pressure switch Malfunction. Check Pressure Switch Setting, Readjust.
Error30	Chamber Pressure Is Greater Than Atmospheric Pressure, S7 Malfunction/ Dry Time is too short.	❖ Occurs if dry phase ends and chamber pressure does not fall below atmospheric. 1. Vacuum Pump Malfunction. ✓ Check Vacuum Pump is working correctly. 2. Solenoid Valve Malfunction. ✓ Check S3, S7 are working. 3. Dry time is too short. ✓ Change cycle parameters, Dry Time. 4. Control Out of Calibration. ✓ Contact EGIC for a Service Visit.
Error31	PT100, Waste Broken	❖ Occurs if waste line temperature reading is outside the normal range. 5. Loose connection in probe wiring. ✓ Repair. 6. Probe Malfunction. ✓ Replace. ✓ Recalibrate.
Error32	Recorder Temperature Deviation Alarm	❖ Occurs if Record and control temperature readings differ more than 1°C. 7. Loose connection in probe wiring. ✓ Repair. 8. Probe Malfunction. ✓ Replace. ❖ Recalibrate.

Note. If the error is corrected the system automatically acknowledges the alarm. If the alarm still persists, please call **EGIC** for assistance.

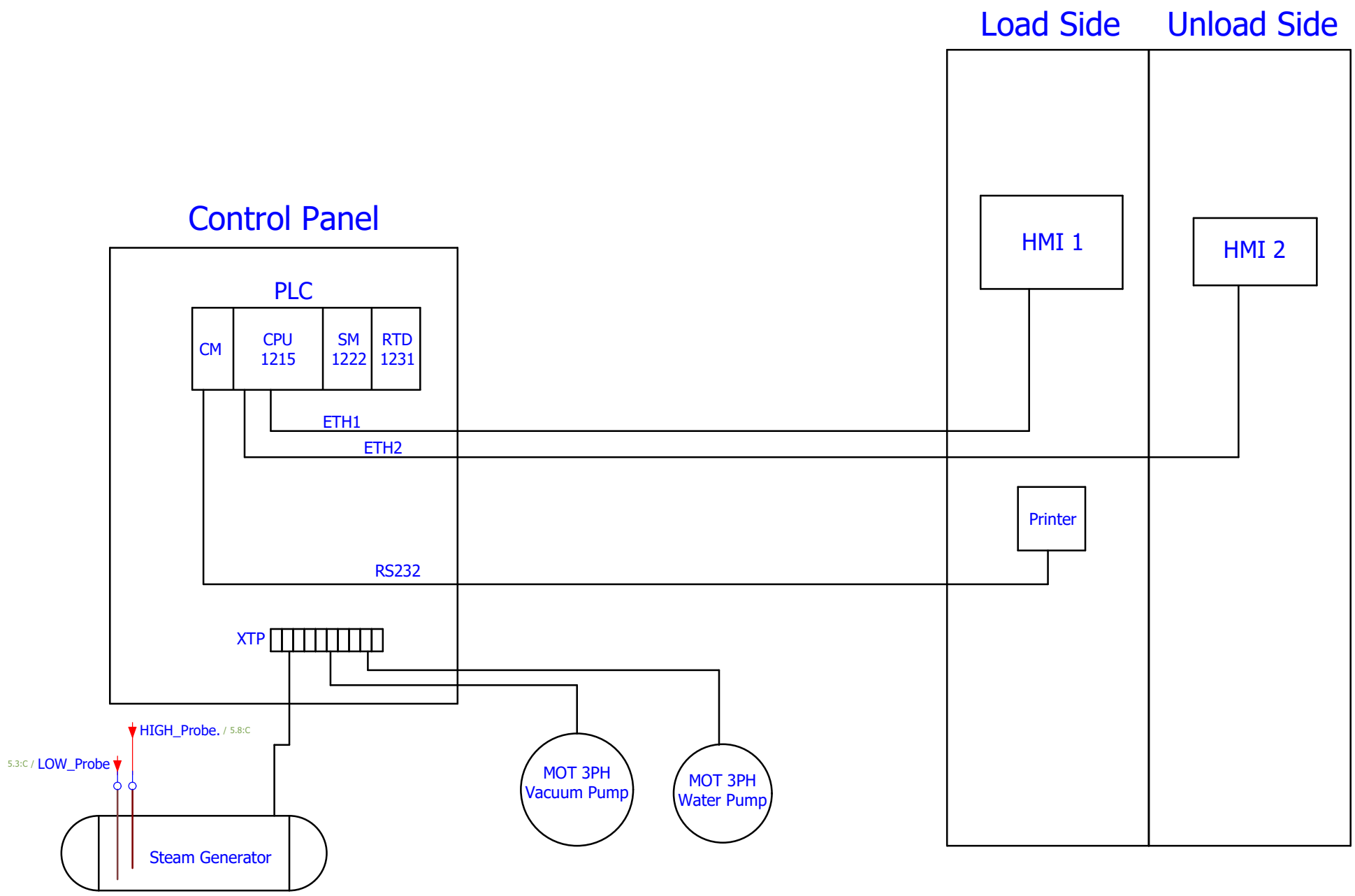
EGIC

Villa 50A,Street 16, Ebad Elrahman

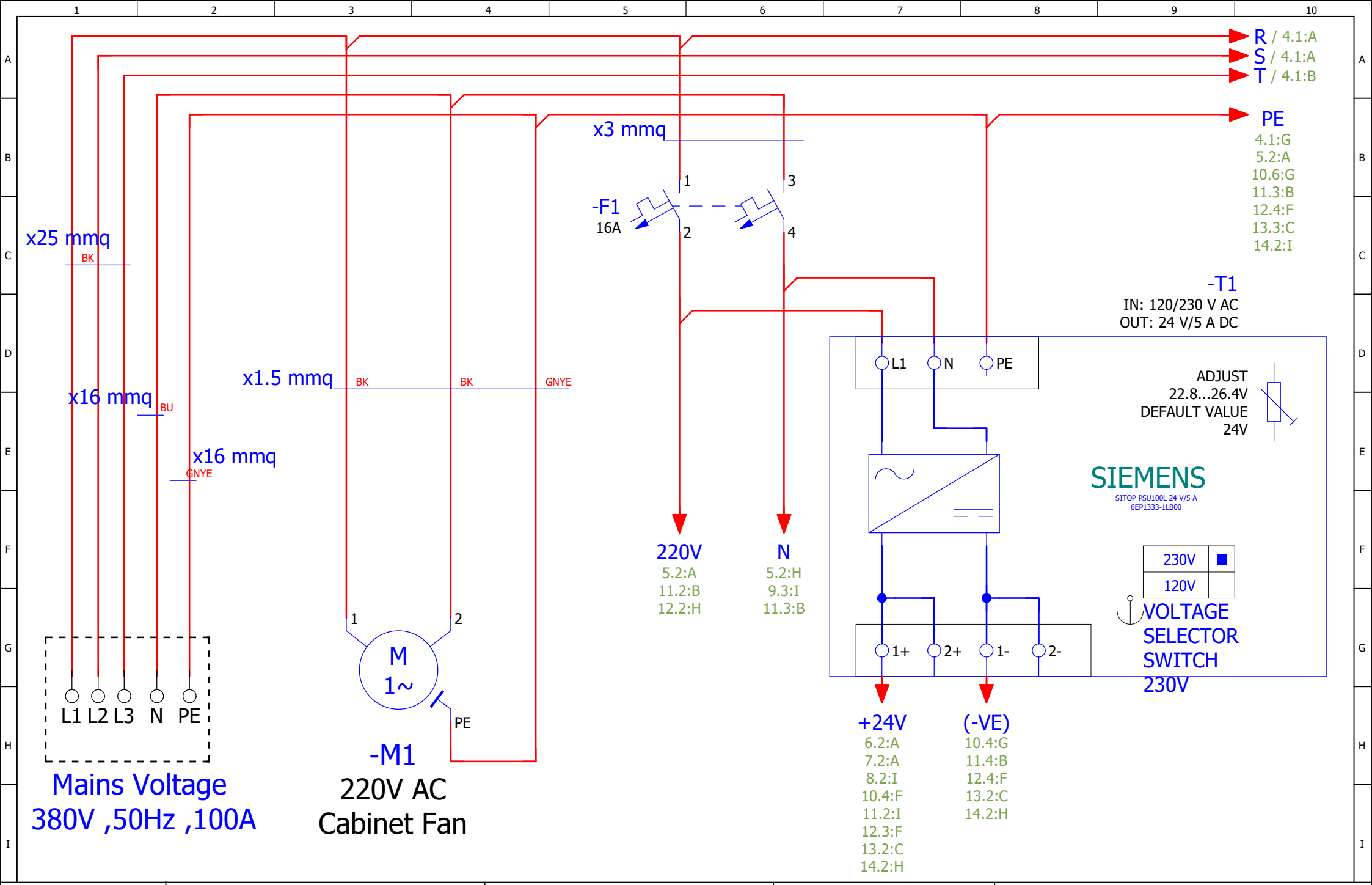
Project Name	EGIC STEAM STERLIZER
Project description	Control Unit
Job number	oct_2101
Customer code	AE5011
Customer phone	01002231052
Type	Schematic project
Place of installation	
Power supply	400 VAC
Control voltage	220 V Ac
Creator Name	ALI ELGARHY

Created on 8/5/2021
Edit date 10/12/2021 by ALI ELGARHY

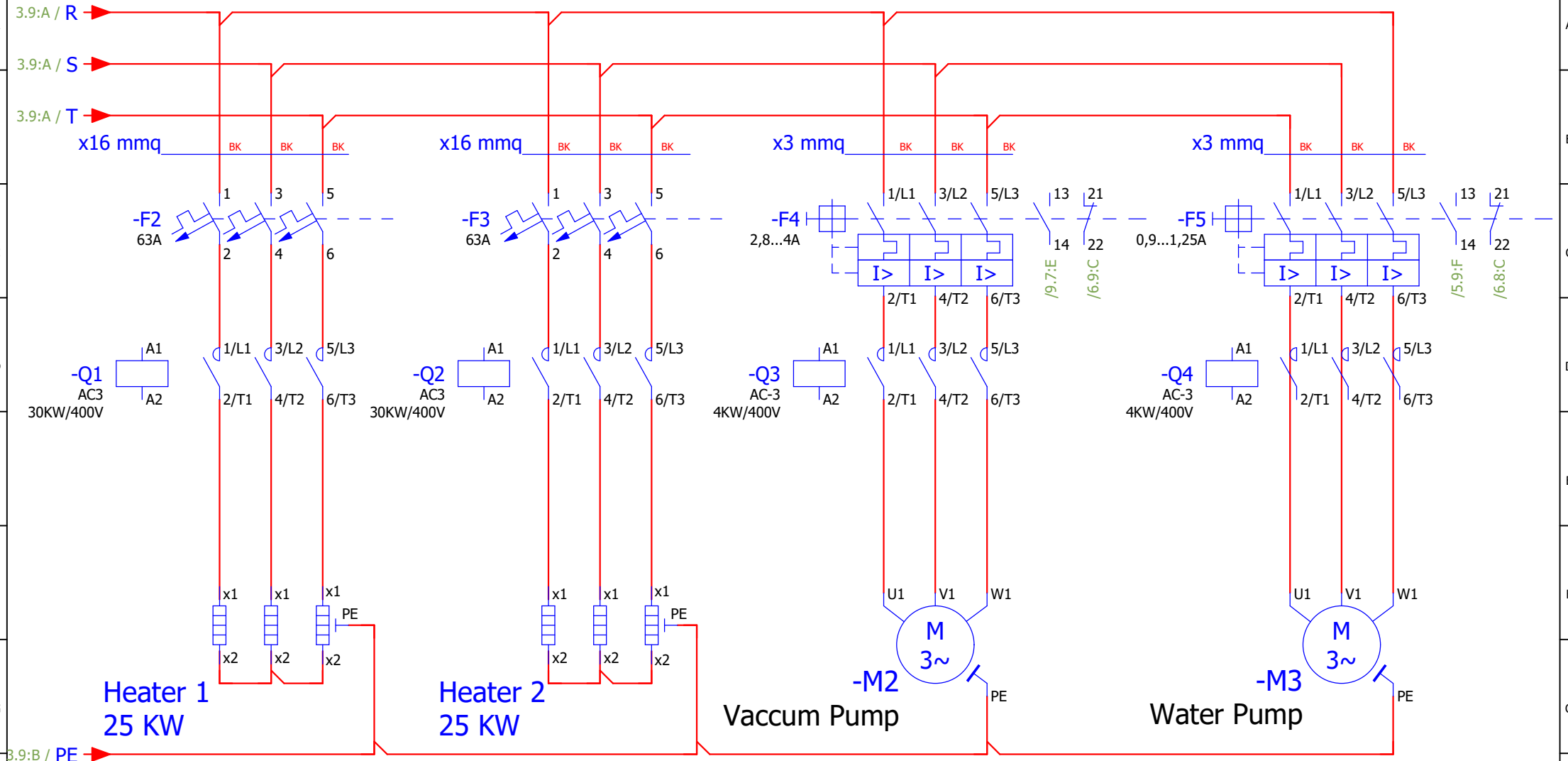
Number of pages 17



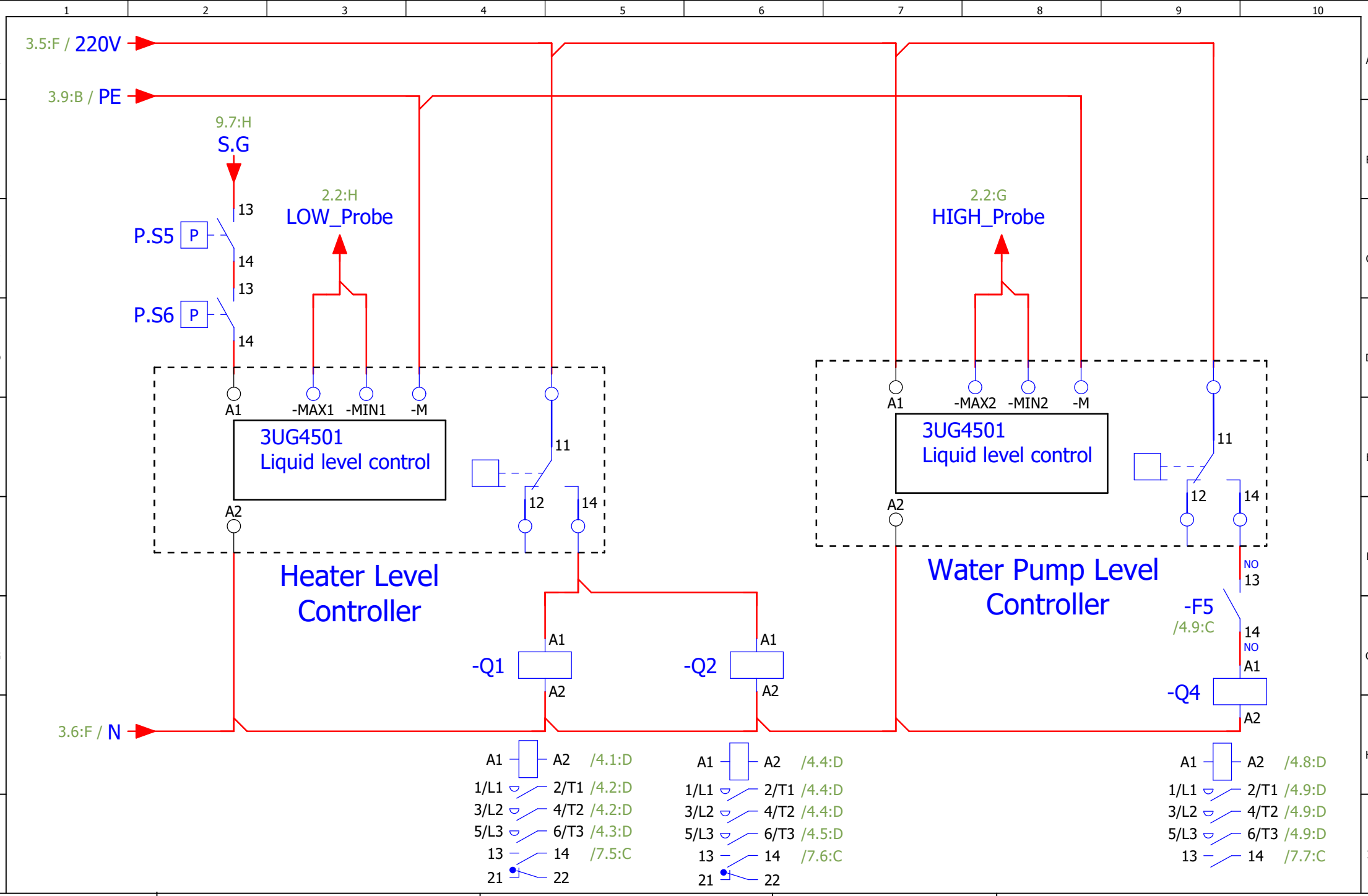
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Description	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 2



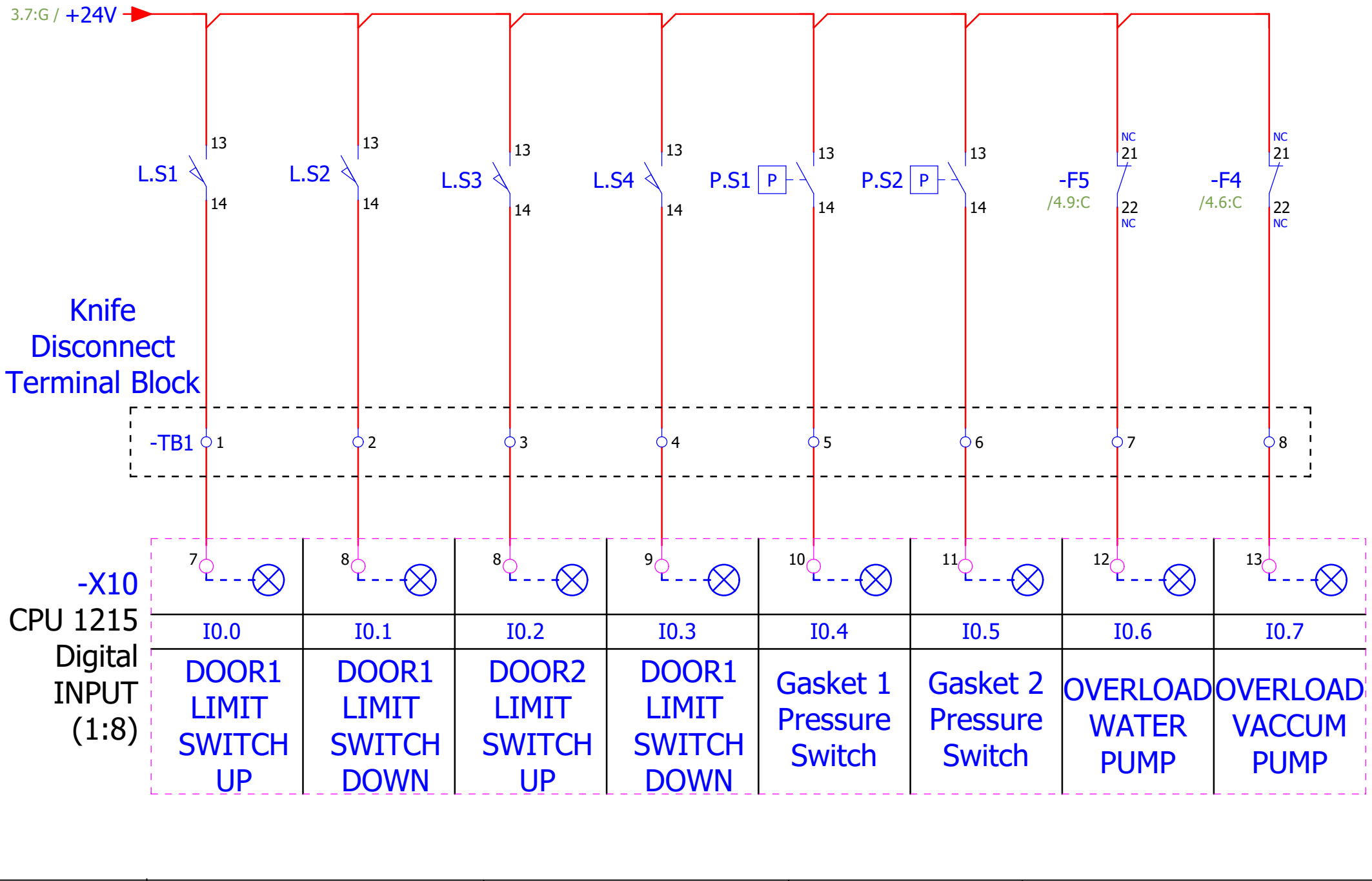
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Mains Voltage Input	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 3



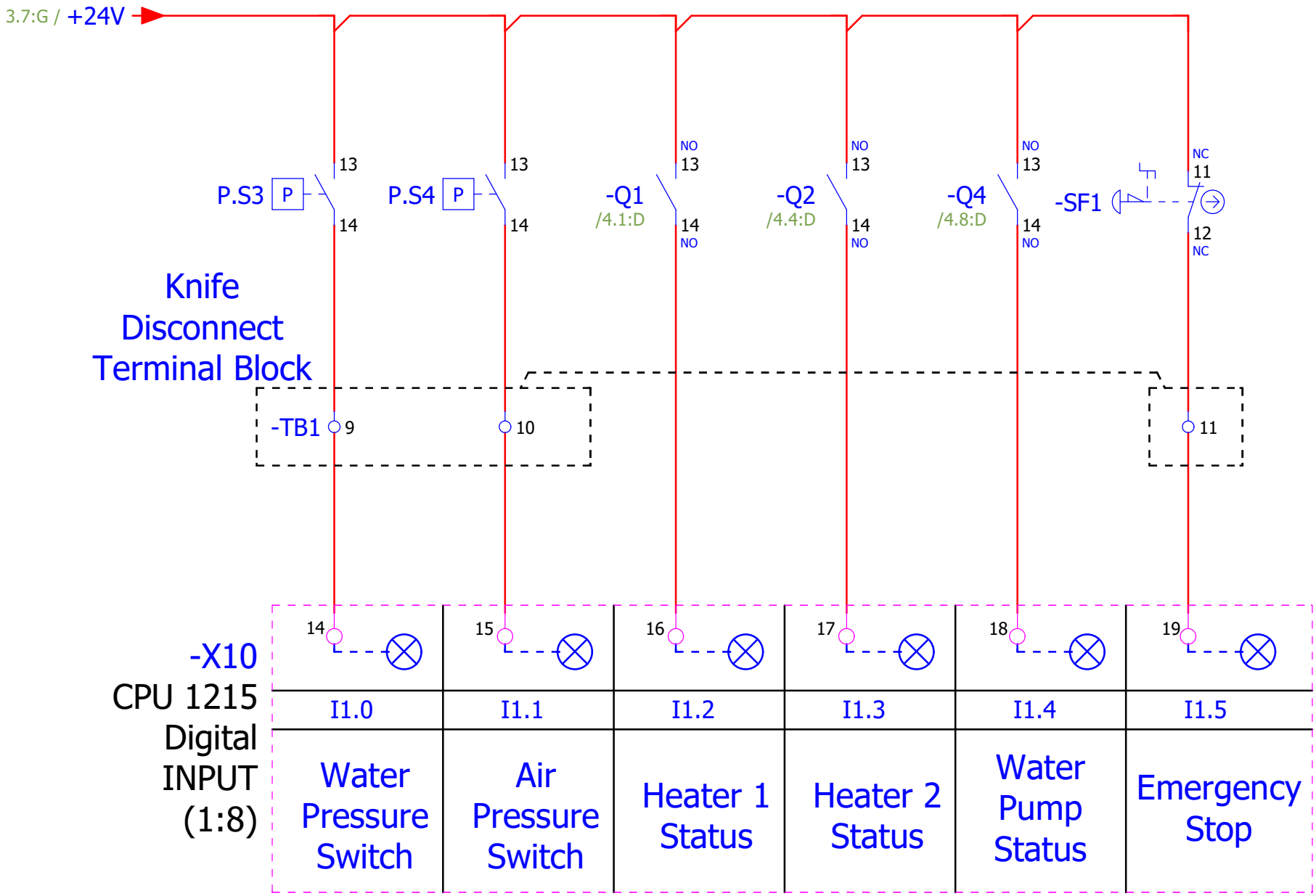
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Power Circuit	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 4



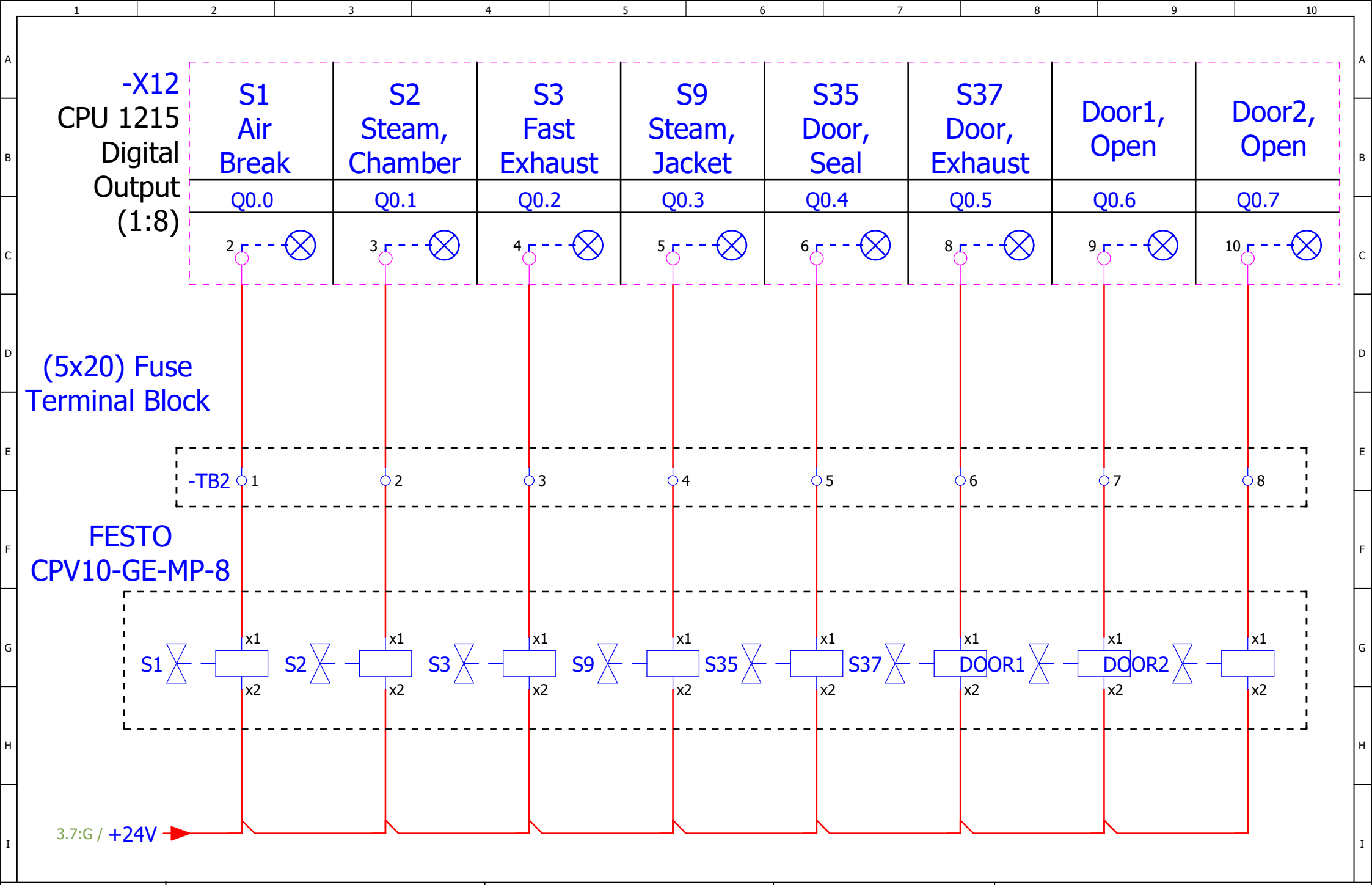
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Level Controllers	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17	Page number: 5



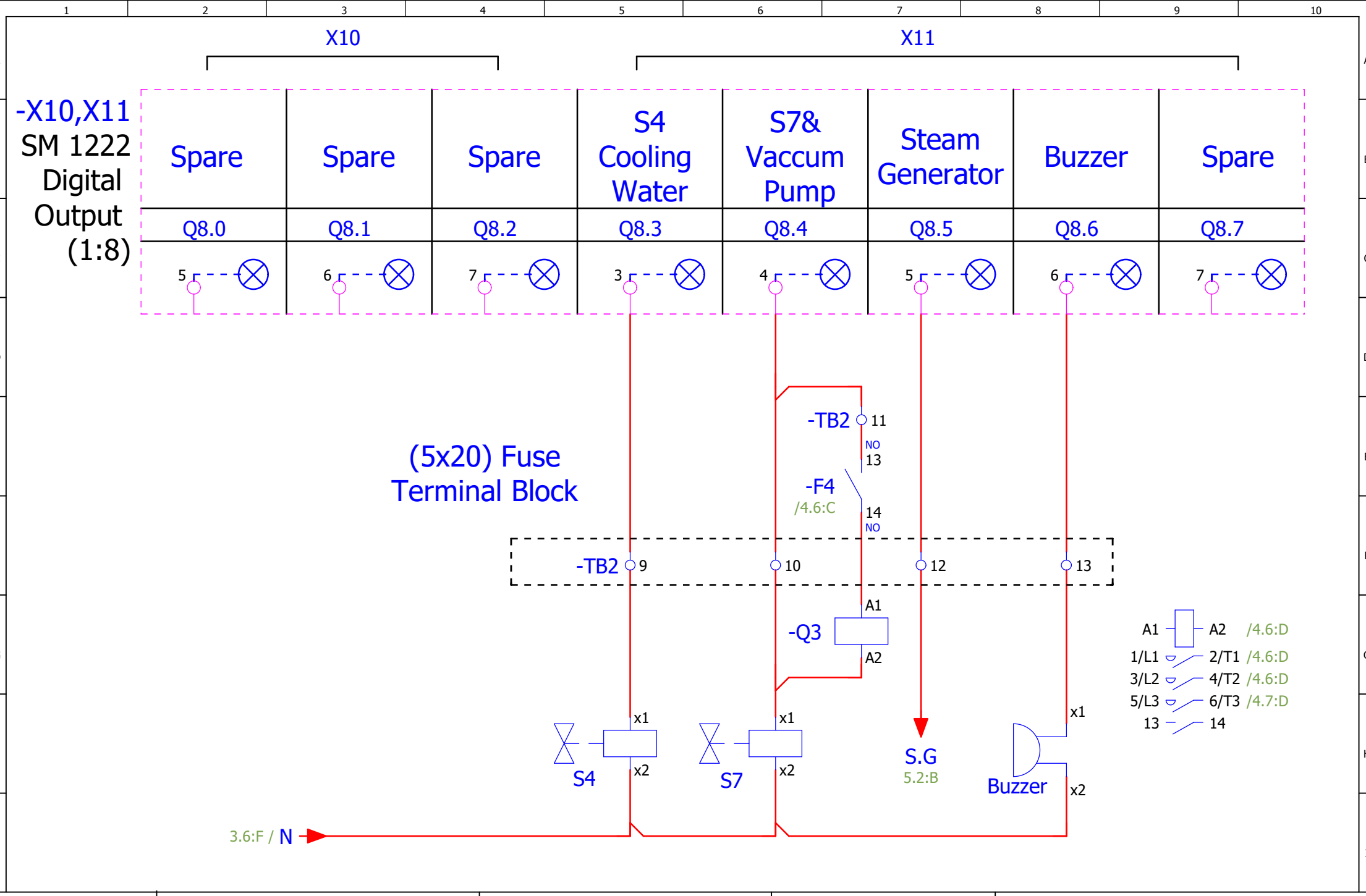
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: DIGITAL INPUTS 24VDC (A)	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt / Total page number: 17	Page number: 6



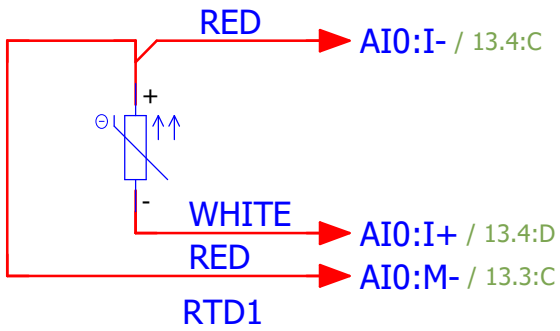
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: DIGITAL INPUTS 24VDC (B)	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt / Total page number: 17	Page number: 7



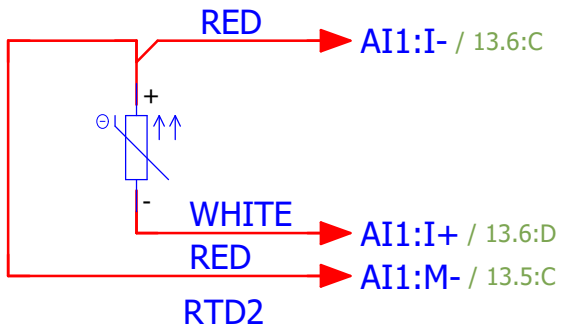
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: DIGITAL OUTPUT CPU1215, 24VDC	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 8



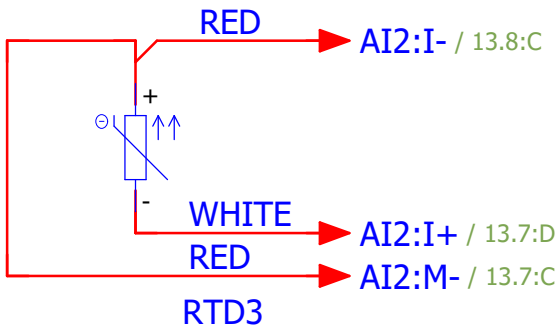
Date: 10/12/2021	EGIC STEAM STERLIZER Control Unit		Company Name EGIC	Page description: DIGITAL OUTPUT SM 1222, 220VAC	
Creator name: ALI ELGARHY			Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 9



PT100, CHAMBER

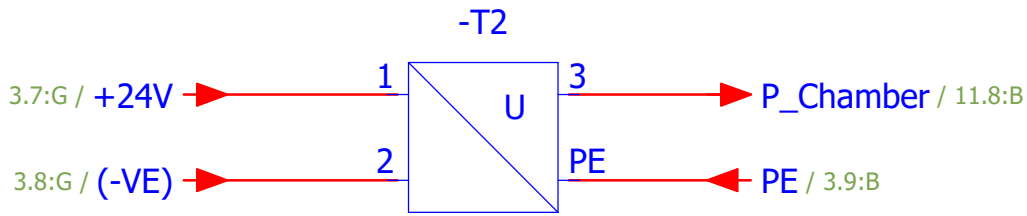


PT100, JACKET



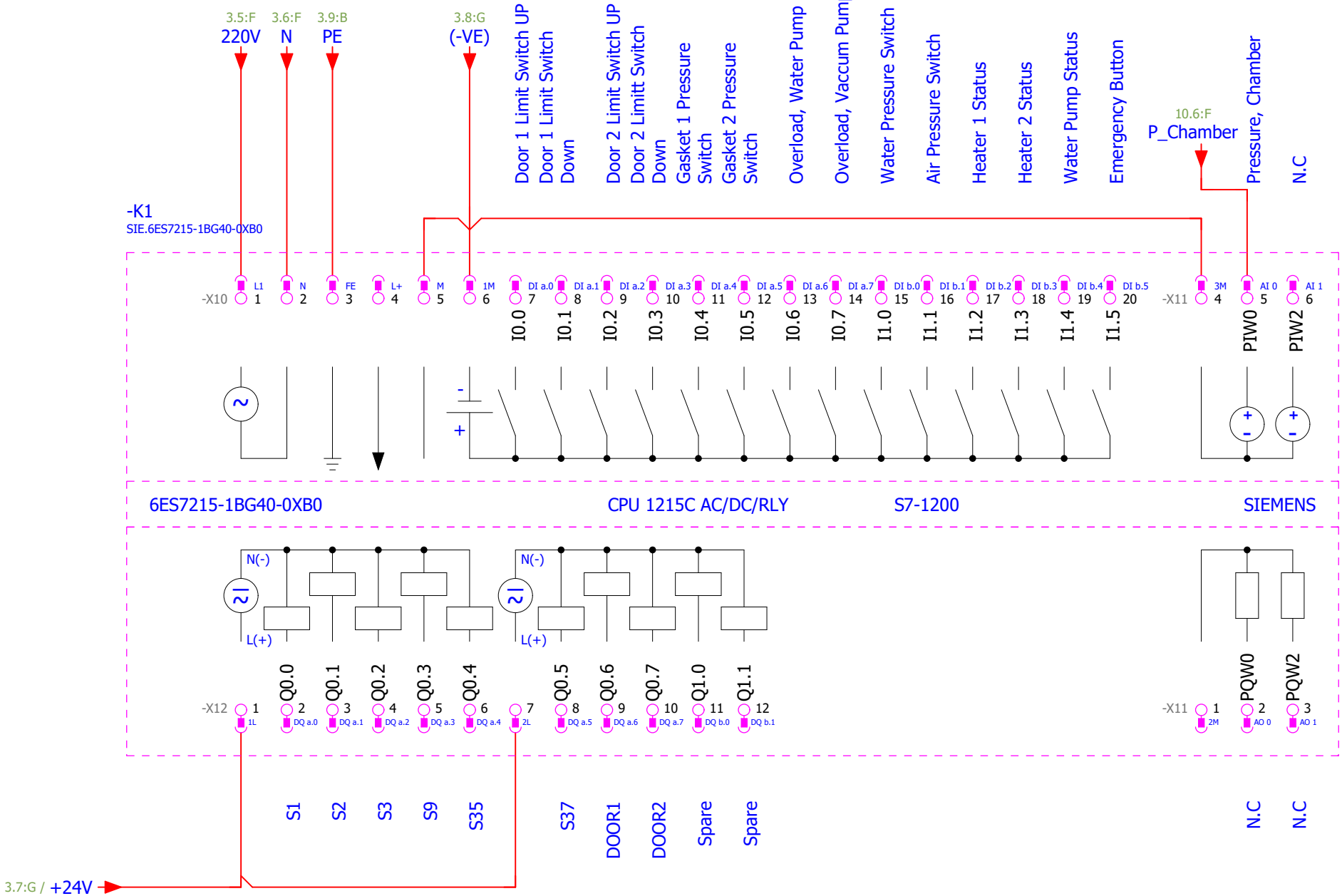
PT100, EXHAUST

SM 1231 RTD
3Wire RTD Connection



Pressure Transducer Connection
Chamber Pressure

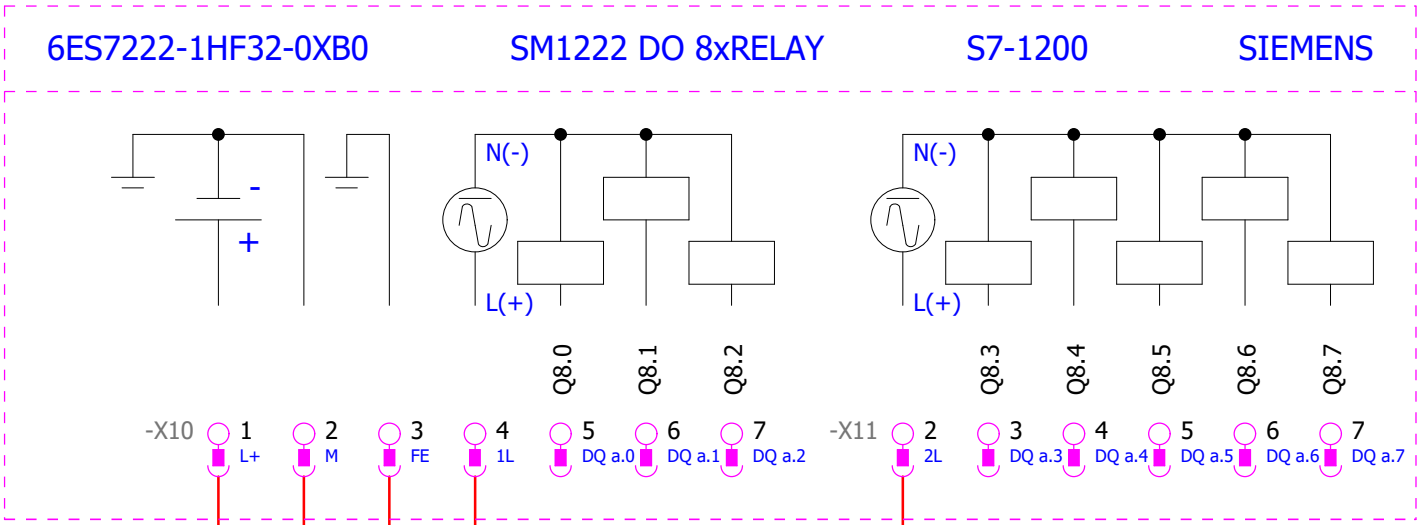
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Analog Input	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 10



Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: CPU 1215 Connection	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 11

-K2

SIE.6ES7222-1HF32-0XB0



+24V (-VE) 3.7:G

PE 3.9:B

Spare

Spare

Spare

S4

S7

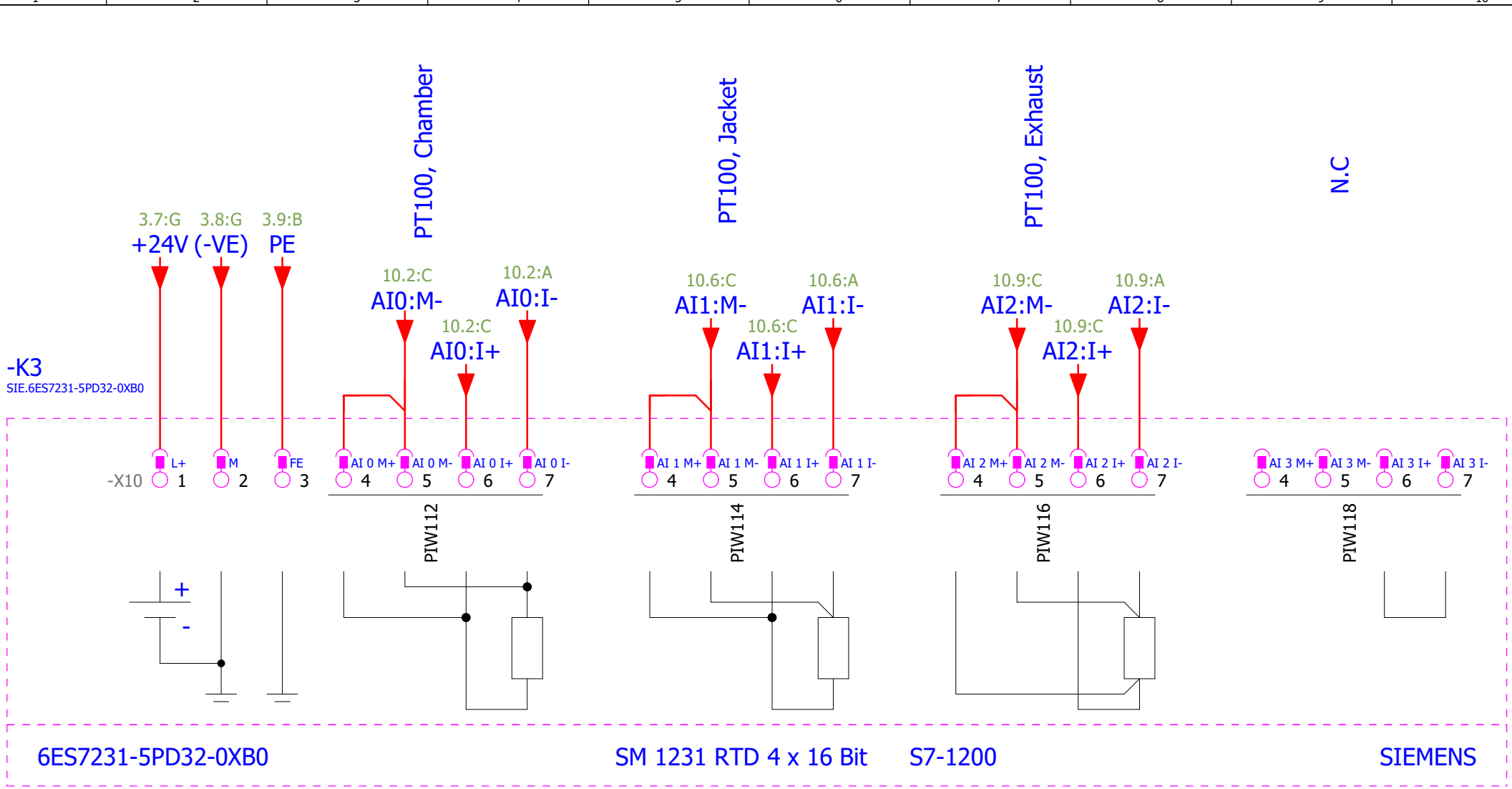
S.G

Buzzer

Spare

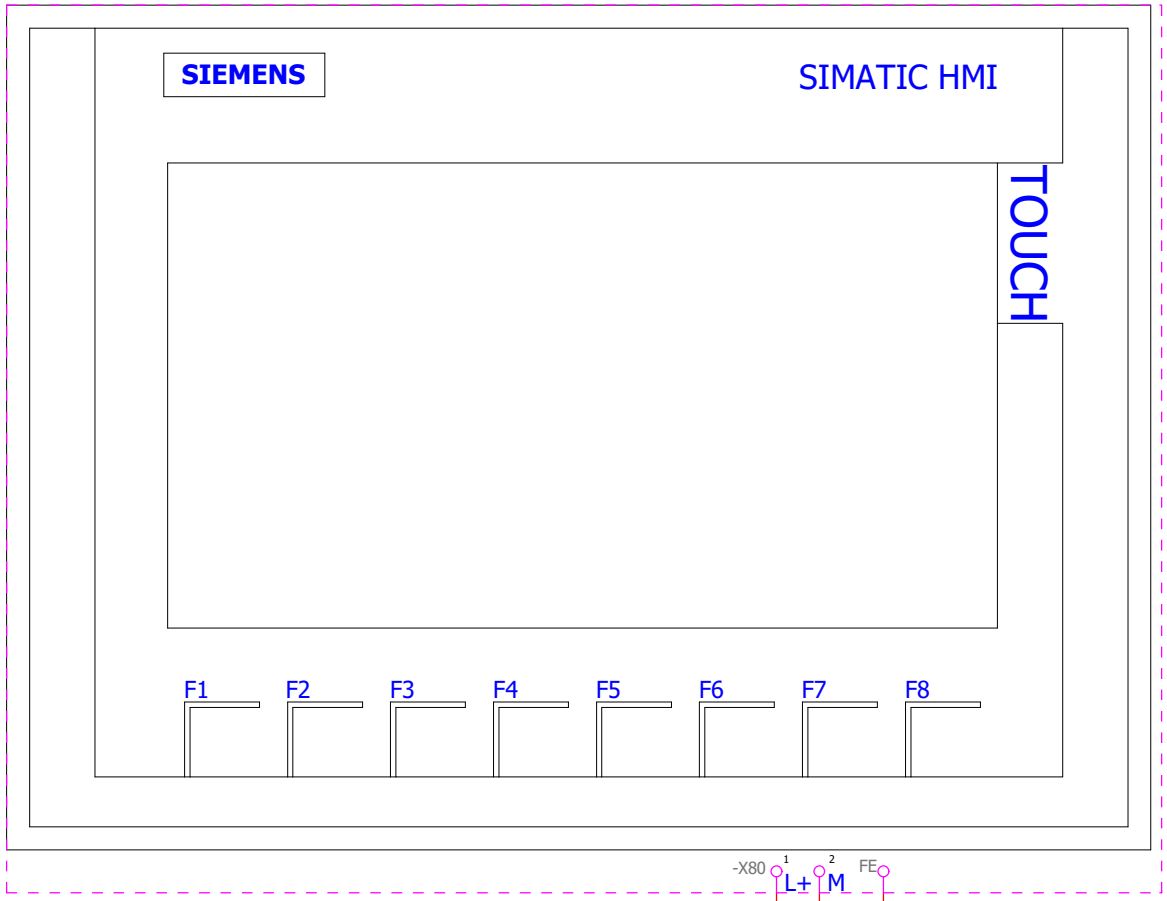
3.5:F / 220V

Date: 10/12/2021	EGIC STEAM STERLIZER Control Unit		Company Name EGIC	Page description: SM 1222 Connection	
Creator name: ALI ELGARHY			Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 12

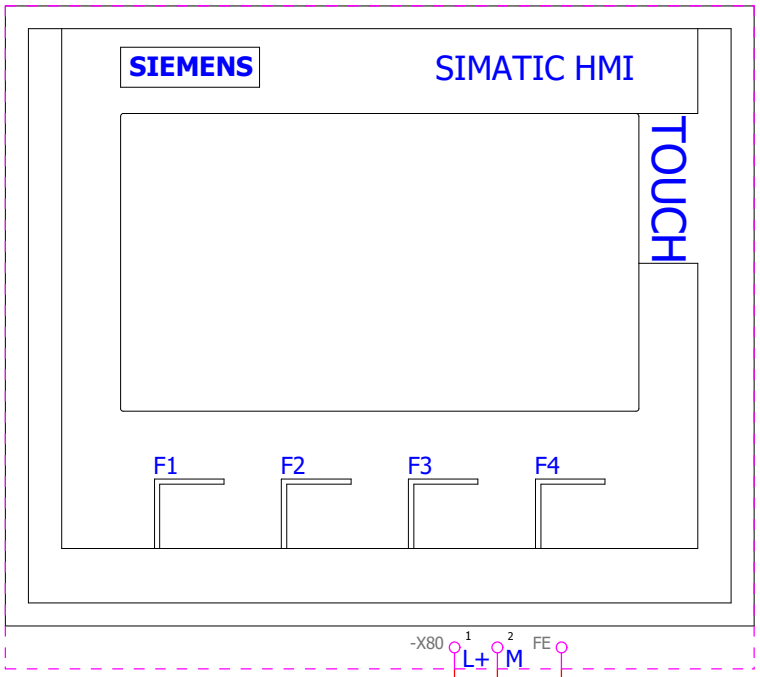


Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: SM 1231, RTD Connection	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 13

HMI 1



HMI 2

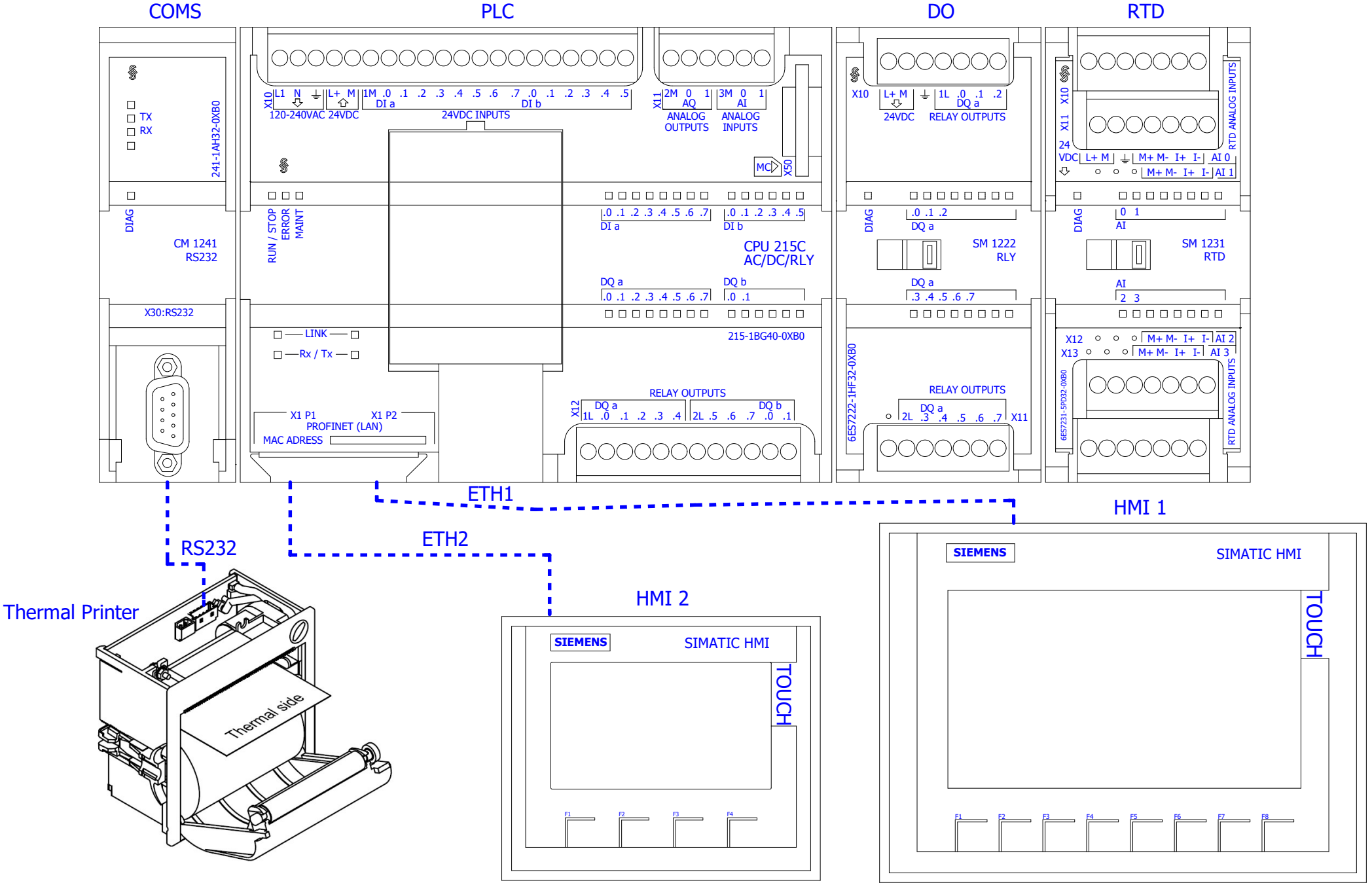


3.7:G / +24V

3.8:G / (-VE)

3.9:B / PE

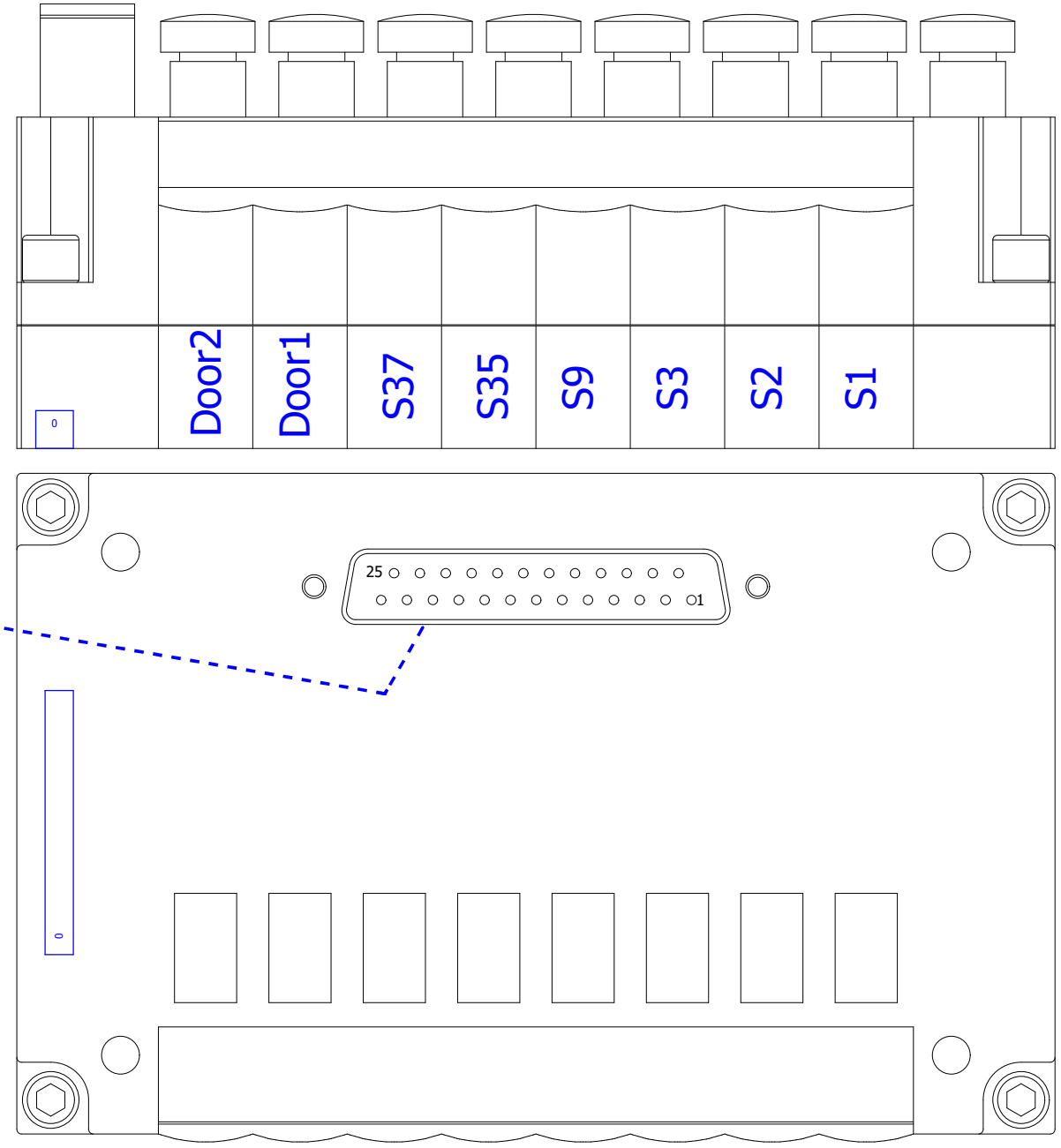
Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: HMI Power	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 14



Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: PLC + HMIs + Printer	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 15

Pin	Wire Color	Valve 24 V DC	
1	White	S1	14
2	Green		12
3	Yellow	S2	14
4	Grey		12
5	Pink	S3	14
6	Blue		12
7	Red	S9	14
8	Violet		12
9	Grey-pink	S35	14
10	Red-blue		12
11	White-green	S37	14
12	Brown-green		12
13	White-yellow	Door1	14
14	Yellow-brown		12
15	White-grey	Door2	14
16	Grey-brown		12
17	White-pink	N.C	
18	Pink-brown	N.C	
19	White-blue	N.C	
20	Brown-blue	N.C	
21	White-red	N.C	
22	Brown-red	N.C	
23	White-black	N.C	
24	Brown	24 V	
25	Black	24 V	

FSETO
CPV10-GE-MP-8

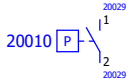
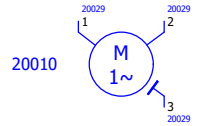
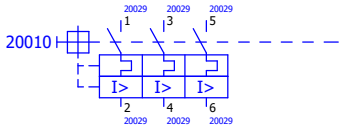
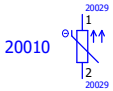
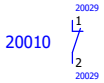
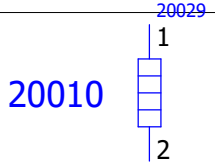
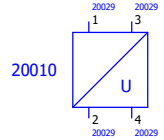
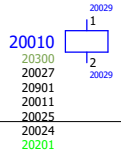
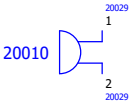
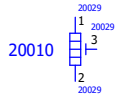
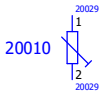
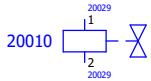
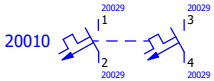
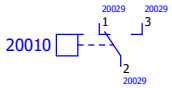
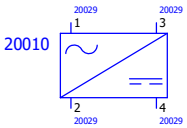
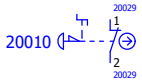
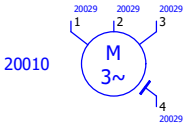
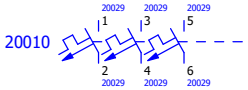


Date: 10/12/2021	EGIC STEAM STERLIZER		Company Name EGIC	Page description: Pneumatic Valves Unit	
Creator name: ALI ELGARHY	Control Unit		Address: Villa 50A,Street 16, Ebad Elrahman	Creator country: Egypt	Total page number: 17 / Page number: 16

Symbol overview

IEC_symbol

my_symbole_report

Power NO contact		Switch, NO contact		AC motor with PE	
NO auxiliary contact		Motor overload switch three-pole		Analog sensor, 2 connection points	
NC auxiliary contact		Heating, 2 connection points		Measuring transducer, variable	
Coil for power contactor		Signal device, acoustic, single		Heating, 3 connection points	
Terminal, general, with saddle jumper, 2 connection points		Resistor, single		Limit switch, NO contact	
Valve, single		Double circuit breaker		Switch, change-over contact	
Rectifier, variable		Pushbutton, NC contact			
Three-phase motor		Triple circuit breaker			

16

			Date	10/12/2021		EGIC	Symbol overview : IEC_symbol 0 - 1374		
			Ed	ALI ELGARHY					
			Appr		Control Unit			oct_2101	Page 17
Modification	Date	Name	Original		Replacement of	Replaced by			Page 17 / 17