



USER GUIDE

MODEL

2734

Ultrasonic Cleaning System



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GENERAL VIEW

You have just purchased a CRYSTAL CLEAN ultrasonic cleaning system. We appreciate the confidence shown by purchasing a CRYSTAL CLEAN equipment.

Each CRYSTAL CLEAN machine has been carefully tested and has passed our quality controls. However, the lifetime of the machine depends largely on you, so we recommend you to consider the information contained in this manual at the start up and use of your ultrasound equipment. Give special attention to the instructions that we detail below.

FORESEEN USE

Motor clean range equipment is specially designed for cleaning engines, engine parts and accessories. This equipment is designed to cover the needs not only of car repair shops but also for marine and cogeneration engines, aeronautic industry and grinding and remanufacturing engine workshops.

Crystal Clean products achieve a high cleaning quality, effectively removing any kind of dust: greases, oil or carbon deposits. Since cleaning is carried out by immersion, the ultrasonic cleaning achieves a high quality result in every hard-to-reach areas.

SAFETY WARNINGS

1. Use protective equipment against thermal, chemical and splashes risk (gloves, goggles, protective clothing, mask) according safety data sheet of the chemical product. Gloves and clothes must be thermal and chemical protective and glasses completely cover both eyes and the mask should cover both the mouth and the nostrils.



2. Use safety boots to prevent injury from possible falls of parts to be cleaned.



3. Perform cleaning and maintenance while the machine is off.
4. Do not transport the machine with water in the tank.
5. Do not work with the machine if damages are detected.
6. Do not introduce in the machine parts larger than those indicated as useful measures in the technical specifications.
7. When draining the tank for cleaning, wait until the temperature lowers before pouring cold water for cleaning.
8. Keep the lid open while tank is being drained.
9. Use the machine only for ultrasonic cleaning of parts. It is not designed for any other applications.
10. Introduce softly the load and center on platform against rear side (if equipment has platform).
11. Do not place the machine against direct sunlight, nor next to a heat source. In such cases the internal

temperature of the machine increases and may result in a malfunction.

12. This machine is designed for indoor use only. In case of outdoor use, the equipment can be damaged or an electrical failure may occur.
13. Do not use power wires or plugs in bad condition.
14. Make sure you have a good grounding and appropriate supply voltage according to the specifications of the ultrasound machine. The electrical installation where the machine is connected must comply with current regulations and must be installed by qualified technicians.
15. Do not touch or unplug the power wire with wet hands.

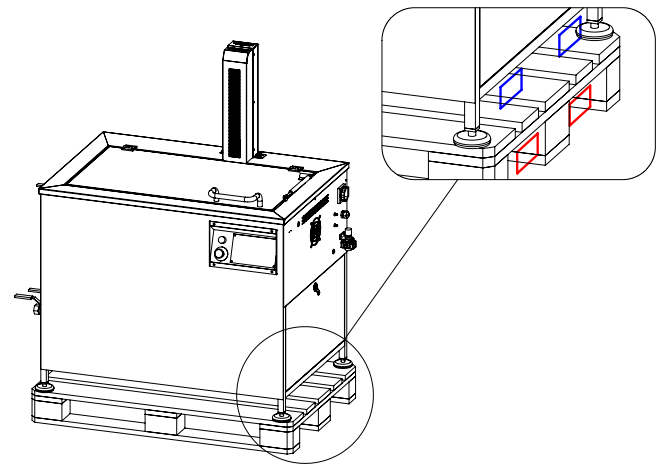


16. Do not access to the control registers. These areas are indicated on the machine with this symbol. In case of disassemble any guard ensure to cut the electrical and pneumatic supplies before. All the guards must be assembled again before start the machine again. Do not work with the guards removed.
17. Disconnect the equipment from the electric network or in case of a long inactivity
18. During the test and maintenance of transducers, generator y or any other electric element, it is required to check that the main switch (which is blocked with a lock) is on the OFF position or "switched off", and also it's advisable to unplug the machine. This way, we make sure that the main energy source is switched off. Otherwise, there is a risk of electric shock.
19. When handling the machine without taking the measures mentioned in the previous point, the corresponding personal protective equipment against electrical hazards must be used.
20. Do not drop any heavy bodies in the tank or press buttons with sharp objects. It can cause serious damage to the equipment or electric shock.
21. The transducers are located at the bottom of the tank. It is very important to avoid hitting the transducers box and avoid placing parts directly on it.
22. ALWAYS OPEN THE LID before activating the rise of the platform.
23. Do not spill liquids such as water, acid or alkaline liquids near the control panel.
24. If a acid cleaning liquid is used the machine may be damaged, depending of how corrosive the used product is. Therefore consult us about the product you will use if it does not belong to those recommended by CRYSTAL CLEAN®. In any case, it is always necessary to consider the measures of use and safety of the product itself, especially those relating to the volatility and the volume of product to use.
25. The equipment is designed to work with neutral and basic products (pH above 6,5).
26. Do not use products with a pH lower than 6,5. In case of doing so, the machine could be seriously damaged.
27. Do not use flammable products.
28. The working area must be properly ventilated and workers must be aware of the possible hazards of the cleaning products that are used. It's necessary to read

the safety data sheets before using the product.

Trapping hazard with the machines:

1. Work clothes should fit the body and the operator must not wear any clothing or hanging rings, bracelets, chains... which may be caught with the moving parts of the machine causing an injury to the operator.
2. Do not modify nor remove the coverings and protections of the machine.
3. Do not activate the platform while there is any body part inside the tank.



Risk of electrical accidents:

1. Check that the machine, equipments and instalations are in good condition
2. Stick to the guidelines given in the manuals regarding disconnection and maintenance of electrical appliances.
3. Do not use equipment when wet, when the operator is wet or in the presence of water or moisture. The electrical equipment will be deposited in dry places and should never get wet.
4. If a fault or malfunction is detected, the operator must call the Maintenance Service (phone number is indicated in last page) and he should never try to repair it by himself.
5. In case of malfunction, the operator must inform the rest of his coworkers, stop using the equipments and prevent the rest of the workers from using them.
6. Equipment and individual protections used must be certified.

If you have to work in electrical installations, please remember:

1. Cut off all voltage sources.
2. Block breaking devices (switches, circuit breakers, etc.).
3. Verify the voltage absence.
4. Ground and short-circuit all possible voltage sources.
5. Demarcate and mark out the working area.

This list of safety warnings do not include all possible misuse of the machine, but it describes the most predictable. The person responsible for the safety at the machine owner company must be commissioned to assess, monitor and control the use of this machine.

SET UP

1. The machine is supplied packed. Check that the packaging is in good condition before removing it. When removing the packaging, do not use sharp elements such as scissors or cutters to avoid marking the machine.
2. Use a forklift to move the machine and make sure that you use the red points of support when using a pallet and the blue ones when lifting the machine directly.

3. Distance the unit 300mm / 11.81" or more from the walls or from other machines, since the semiconductors integrated into the generator make it temperature sensitive. The high temperature may cause malfunction.
4. Connect to a power source of appropriate voltage as indicated on the equipment. Always ensure the machine is properly grounded. **See equipment specifications.**
5. The cleaning tank must be placed horizontally on a firm surface and leveled.
6. The equipment must be placed in a dry place.
7. The air connection must maintain a constant pressure of 6 bars. (Recommended operating pressure).
8. The size of the water connection for filling and emptying the tank will depend on the model (**See technical specifications**). If there are security overflows, they must remain open.

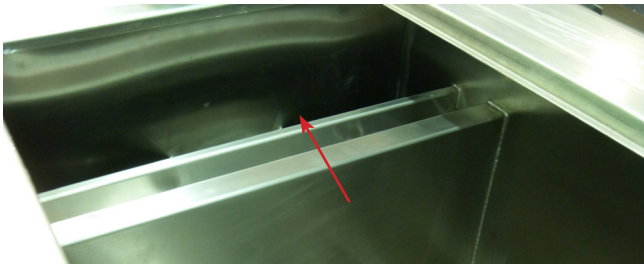
BEFORE START UP

Personnel in charge of handling and operating the machine must have training in handling it and its inherent risks. This machine carries risks due to chemical substances, electrical elements and tires.



IMPORTANT: READ THE MANUAL BEFORE DOING ANY TASK WITH THE MACHINE.

1. Connect to a suitable electrical outlet (**IMPORTANT: See equipment specifications and check the type label on the machine.**)
2. Ensure that the drain valve is closed.
3. Do not operate the ultrasonic equipment without water. When the machine is started without fluid the transducers, the heating element and other components get damaged immediately. **Ensure the tank is full before operating the equipment.**
4. Fill the main tank to its maximum water level. In model with WFS up to the top of the separator connecting the main tank with the auxiliary tank (see image). Fill the auxiliary tank by overflowing over the separator.



IMPORTANT: Always exceed the minimum level marked. If not so, transducers and heating elements may get damaged.

5. WFS fill the auxiliary tank through the main tank (overflowing over the separator).
6. Turn on ultrasounds.
7. Turn on heating element (recommended temperature: 68°C / 155°F to 74°C / 165°F). Be careful with the hot parts of the machine, specifically the valves located on the left side, the cleaning liquid and the parts cleaned when removed from the liquid.
8. Before cleaning any part, and every time you change the water of the tank, it is necessary to DEGAS the water. For this we must let ultrasounds work for 2 to 3 hours, depending on water hardness. We will know when the water is degassed when it stops leaving out small bubbles (oxygen molecules).
When the diluted product is added to the tank, an abrupt change in water cavitation can be appreciated for about two minutes. Then the bath is ready to work. Whenever we add water by accumulated losses when parts are taken out or by evaporation, it is important to add the product in the same proportion.
The percentage of the product to be mixed with the water will depend on the type of product (see technical data sheet of the product purchased).
9. The ultrasonic unit comes with built-in programming. However, it can be changed.
10. Do not place parts, cleaning baskets, or cups directly on the bottom of the tank (on top of transducer box). This is a common cause of defects in vibration, and also shortens the life of the transducer.
11. Immerse the parts to be cleaned in the cleaning tank gently, taking special care not to hit the base or other components. These incidents can damage the parts or shorten the life of the transducer.
12. The bath will be effective for longer if we carry out oil extractions and water filterings. There is no provisions for water and product exchange as it depends on the quantity of cleaning performed and the degree of contamination of parts washing time.
13. Performing extractions of oil and filter the water bath will last longer. As with changing the bath, there is not a stipulated periodicity of the filterings and oil extractions because it depends on the parts to be washed and dirt. This frequency should be assessed by the staff in charge of the equipment.
14. When the platform is down, the cover must be closed before proceeding to the cleaning process.
15. When the cleaning is finished, let the piece drain to avoid risks of dripping. Make sure it does not drip before removing from the platform.

Setting up and initial operations must only be carried out by CRYSTAL CLEAN personnel. At the time of installation, a representative of CRYSTAL CLEAN will conduct a demonstration and give all the explanations deemed appropriate.

Installation and commissioning carried out by unauthorized personnel can cause damage to both operators and the machine.

THE USE AND MISMANAGEMENT

The machine is designed for the operator to work at the front, except for maintenance works where you can access the machine where necessary.

When the cleaning is done, the pieces will be at an elevated temperature, it is necessary to use thermal protection gloves for handling.

Do not put into the machine parts with a higher volume than 30% of the total tank volume.

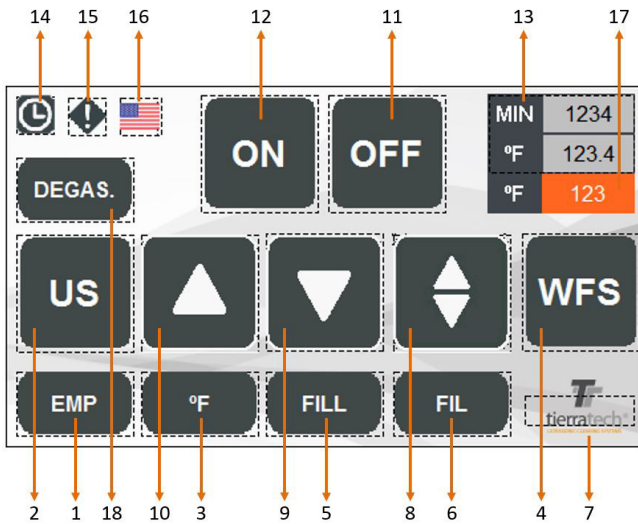
Do not insert parts whose measures and/or weight are greater than described in the specifications.

You should not work without adequate water level.

To drain the machine it is necessary to wait until the cleaning liquid has decreased in temperature in order to avoid thermal contact damage.

Insert the parts to be cleaned in the tank free of flammable liquids.

CONTROL PANEL AND FUNCTIONS



1. **EMP (if installed):** On/Off drain tank function. If this function is On, the button is highlighted in white.
2. **US:** On/Off ultrasound function. If this function is On, the button is highlighted in white.
3. **°C / °F:** On/Off heating function. If this function is On, the button is highlighted in white.
4. **WFS (if installed):** On/Off WFS function. If this function is On, the button is highlighted in white.
5. **FILL (if installed):** Enables or disables filling tank function. If this function is On, the button is highlighted in white.
6. **FIL (if installed):** Enables or disables tank filtering function. If this function is On, the button is highlighted in white.
7. **SETTING UP SCREEN:** Private access to set up the machine programming . This option is only available for the manufacturer.
8. **MOVEMENT FUNCTION (if installed):** Activates or deactivates an oscillating movement of the platform during the cleaning process. If this function is On, the button is highlighted in white.
9. **PNEUMATIC LOWERING PLATFORM FUNCTION (if installed):** Lowers platform for pieces immersion. If this function is On, the button is highlighted in white. Movement is activated pressing simultaneously both buttons “dead man”. If there is only one button you should press simultaneously the one on the screen.
10. **PNEUMATIC LIFTING PLATFORM FUNCTION (if installed):** Raises the platform for loading and unloading of parts. If this function is On, the button is highlighted in white. The movement is accomplished exactly the same way than the lowering platform.

Any movement (8,9 and 10) that we select it will disable any other which is ON. Also, if we press an activated button, we will disable it immediately.
11. **AUTOMATIC CYCLE “OFF”:** When automatic cycle is ON this button turns in red. Allows to disable the
12. **AUTOMATIC CYCLE “ON”:** Automatic cycle activated (this button turns in green). Once the automatic cycle is ON all the manual functions will be off. Automatic cycle connects and disconnects all the consecutive functions. The timer and the working temperature for each function will set up in each recipe. If the platform is installed , it will make a first down movement automatically, afterwards it will start to make a continuous movement automatically.
13. **MIN FUNCTION:** Time left for automatic cycle (countdown).

°C / °F : Current tank temperature. Pressing on this button we enter in the recipe screen for automatic cycle.
14. **PROGRAMMING:** This function allows you to set up a weekly program.
15. **HISTORICAL ALERTS:** This button allows you to check the alarms or warnings . The button will blink and turns in blue, if there are alarms.
16. **LANGUAGES:** It allows to change the language on the screen (If you change to USA it will change to degrees Fahrenheit).
17. **TEMPERATURE SET VALUED:** It shows you the target temperature and pressing on it you can modify.
18. **DEGAS:** Activates or deactivates ultrasound operating mode for degassing water (additionally it is required to activate the US function, button 2). If this option is active, the border is highlighted in white.

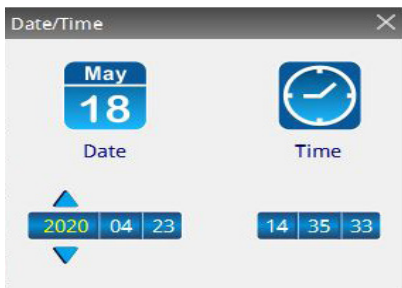
IMPORTANT:

If, for any reason, the date and time are reseted (because the touch screen battery is damaged, because the machine takes a long time off, etc.) you need to follow the protocol below:

1. Click on the main screen ,option (14) and press on the following area to set up the date and time:



2. Click on arrows to move along the date and time. Press on + (to increase number) or press on - (to decrease number). Click on SAVE to release the changes. If you wish to cancel the changes or to exit of the screen, click on QUIT.

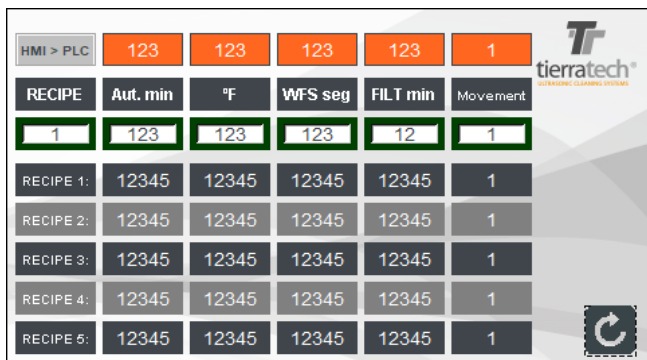


START UP AND CLEANING PROCEDURES

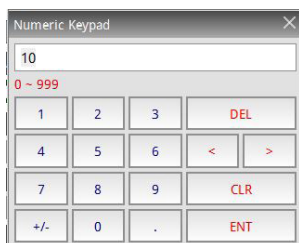
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1. Turn on the switch located on the rear / on the right side of the equipment (it depends on the model).
2. Select the function (13) to set up the information for the recipe.



Press on white gaps to set the numeric data for the following options

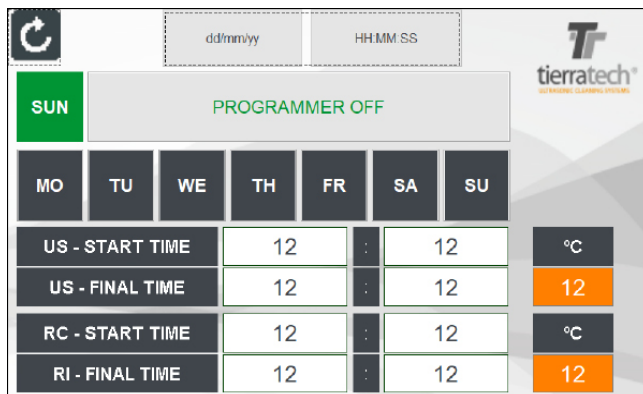


- RECIPE NUMBER: Set up the recipe number which you would like to modify. It can be realize until five recipe.
- AUT. MIN: Time (minutes) for automatic cycle.
- °C / °F : Working temperature.
- WFS SEG: Time (seconds) during the WFS pump is working.
- FILT MIN:Time (seconds) during the FILTER pump is working.
- MOVEMENT: Selecting “1”, you will activate the movement (in platform) on automatic cycle. If “0” is selected the movement will be disable.

Once a recipe is modified the changes will be released below. To upload a recipe to the machine you should select a recipe and press the button HMI>PLC.

To return to main screen press on right below arrow button.

3. If it’s required, you are allowed to set up a weekly programming. You must be press the function (14) on the main screen.



On this screen, it shows a temperature program on a weekly schedule. To start up this function you should introduce a “START TIME” (press ENTER to confirm) and minutes (press ENTER to confirm) and active the weekday button. After, you have to introduce the hours and minutes in “FINAL TIME” to stop the program.

Once the programming days are selected the buttons turns in green and you should press the PROGRAM ON function to release. This function will be disabled if we selected PROGRAM OFF.

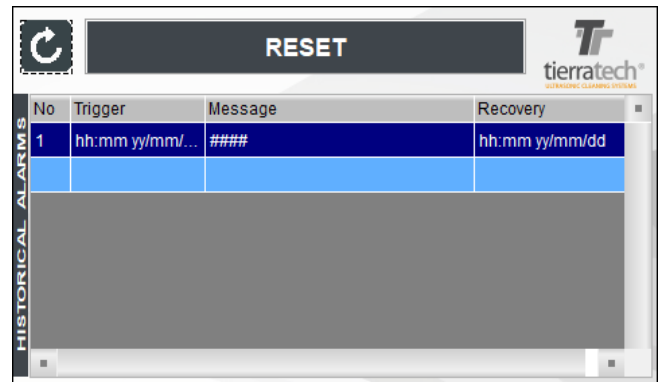
This function will always work with the previous fixed temperature. To set up our cleaning program we press on the number which is showed the temperature. On this screen appears a numeric board and you should press the desired temperature for working. Confirm with ENTER (It is not allowed to fix the temperature higher than 90°C / 194°F).

4. The first program must be to DEGAS the water, applying ultrasound long enough to stop small bubbles emerge. The process will last at least 3 hours (it depends on water hardness). The water must be degassed whenever the whole bath is changed.

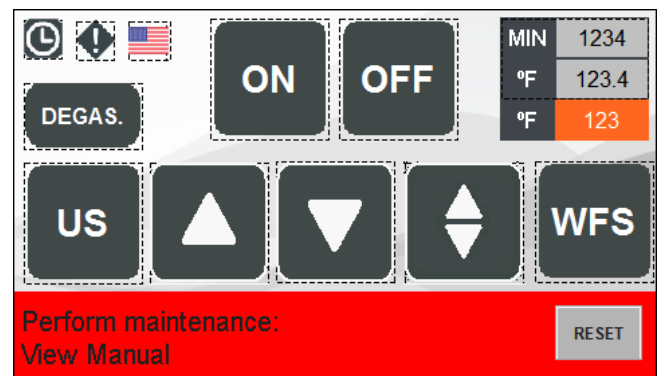
WHEN RUNNING ULTRASOUND, KEEP TRANSDUCER BOXES UNDER REQUIRED LIQUID LEVELS. IMPORTANT FAILURE MAY RESULT IN THE EQUIPMENT IF YOU DO NOT FOLLOW THESE INSTRUCTIONS.

5. Add the recommended amount of cleaning product. The dosage of the product generally varies between 3% and 5% of the equipment capacity (consult CRYSTAL CLEAN before adding cleaning product, as it depends on the soil to be removed and material of parts to be cleaned).
6. Once the liquid has reached the right temperature and the product is mixed properly, proceed to immerse the parts.
Press the function (12) and it will activate the automatic cycle with the recipe which has been uploaded before in PLC. However, if it requires a manual mode it will able and disable the different manual functions.
7. During the cleaning process we can activate the movement function (if installed)(8). This function will start immediately during all automatic cycle.
8. WFS and FILTER (If included):
 - **WFS**
The WFS system cannot be used when the auxiliary tank is empty.
The pump has 3 speeds. The fastest one is selected by default. After a cycle of cleaning, the pump will run automatically during one minute and it is important to maintain the security level of the fluid for the pump not to break. In case of manual activation start the cleaning cycle immediately and before of taking out the pieces from the tank.
 - **FILTER**
In this function, it activates the filter pump following the WFS pump. In the manual option it should start immediately after de WFS function
9. Automatic filling system (5) (if included).
This system allows the machine to maintain a constant water level in the tank.
Connect a water supply hose to the fill-in solenoid valve.
Once connected, open the fluid flow. A level sensor will automatically maintain a constant fluid level in the tank.
10. Drained system (if included): The draining will be always manually when it requires empty the tank for maintenance task or replacing the bath. Once this function is ON it will drain the tank until the minimum security level. To drain the left liquid you must be press the button in 10 seconds pulses.
11. Alarms Screen (15): When the icon is blinking it means there are warnings. If we pressed on , it will show historical alarms of the machine.

If you press on "HISTORICALALARMS" will show a RESET button which remove all the showed alarms.



ATTENTION: WHEN THE WORKING HOURS ESTIMATED HAVE BEEN ACCOMPLISHED , IT WILL APPEAR A MESSAGE ON THE MAIN SCREEN WARNING ABOUT THE MAINTENANCE TASK TO FOLLOW. SEE MAINTENANCE SECTION.



WATERFLOW SYSTEM

(IF INCLUDED)

With this system, through the pump (described in section 8 of the previous section), a circulation is created in the fluid that entrains all the oil and other residues that are on the surface to an auxiliary tank.



With the valves in the open position the pump works to remove the oil from the main tank to the auxiliary tank. This is the normal position that the machine should always have.

To extract the oil from the auxiliary tank, proceed as follows:

- Open the drain valve and install a bucket for the drainage of the oil. This operation is most effective by applying it with low flow rate in the injection. (This valve must always be closed in case it is not performing this operation)
- Inject water (very slowly) through the valve located in the lower part of the equipment (The amount of oil that comes out will be smaller the less the injection of water into the tank).

AIR PRESSURE REGULATOR

(IF INCLUDED)



In the equipment there is the possibility of regulating the pressure of the compressed air (see the manometer) of the pneumatic system of the platform or any other system that requires air.

ADJUSTING THE SPEED OF THE PNEUMATIC CYLINDER

(IF INCLUDED)



By adjusting the regulators it is possible to change the movement speed of the platform.

This zone indicates the maximum weight that can be raised with this machine.

BAG FILTER TTF1 AND TTF2

(IF INCLUDED)

Filtering process of the cleaning liquid to reduce contamination.

Regular checking and emptying of the filter bag and its cleaning are recommended. **When the filter gauge exceeds 1 bar, empty the reusable bag.**

Every time the filter is opened, to return to operation it must be purged through the valve located next to the manometer. Orient the valve hose to the main tank or a can.



To change the filter bag, you must open the filter cover, close the outlet (to the tank) and inlet (to the filter) valves and drain it through the drain valve. Replace the bag and leave everything as at the beginning and purge.



Do not drop small objects into the tank, they may reach the pump and damage it.

Attention: do not open the filter when hot to avoid injuries.



MAINTENANCE

Maintenance of the machine should only be carried out by CRYSTAL CLEAN personnel. If the machine requires further cleaning or shortening service intervals, please contact your CRYSTAL CLEAN delegation. Any incidents or breakdowns should only be repaired by a CRYSTAL CLEAN sales and service representative.

CLEANING LIQUID

It is necessary to periodically replace the used cleaning liquid. It may happen that particles deposited on the bottom of the cleaning tub will clog transducers, resistance and other components, thus causing losses in the quality and intensity of cleaning and reduction of the life of the transducers. This interval for water change depends on the intensity of use of the machine, both in time and in the degree of dirt of the parts to be cleaned.



IT IS RECOMMENDED TO CLEAN THE TANK PERIODICALLY

ULTRASOUND EMITTERS

The surface of the emitter erodes after many years. It is necessary to examine it with each change of water before use. When it is seriously eroded, holes appear on the surface, which in case of penetrating the plate will allow water to enter the interior of the emitter and will generate a fault.

Clean periodically by taking advantage of water changes. The inside of the tank is cleaned using a water hose.

It is necessary to use the cleaning products recommended by CRYSTAL CLEAN, in order not to cause damage to the parts to be cleaned or to the ultrasound equipment itself. Each machine will use a product adapted to the specific application that is needed. CRYSTAL CLEAN will supply the data sheet of the products to be used.

IMPORTANT: NEVER clean them if they are at high temperature. Allow to cool and rinse together with the bottom of the tank. If you want to expedite the process, empty the hot water tank while mixing with cold water so that the temperature gradually drops. This is done to avoid a sudden change of temperature in the emitters (Ultrasound boxes).

GENERATORS

Clean it once a month with a compressed air gun using the safety glasses. If the dirt that is generated at the site where the equipment is located is extreme (eg suspension of particles such as chip powder, paint suspension, polishing powder in suspension, etc.). They will be cleaned more often. DO NOT clean with organic solvents such as solvent, alcohol, or kerosene since the paint coat of the generator may deteriorate or even deform the plastic components of the equipment.

Way of acting:

- Open the back of the unit. Remove the filters from the generators (in the case of models with filters), located at the rear. Blow with air gun (make sure no water gets out with air).
- Blow the generators.

- Mount the filters of the generators.

- Replace the rear panel that has been removed to access the generator.

ELECTRICAL CABINET

Clean the inside of the cabinet with air gun every 1-3 months depending on the accumulated dirt. If the work environment is too dirty, do so at shorter intervals. Whenever the air gun is used it is necessary to use the safety glasses.

HEATING ELEMENT

Check cleaning at each water change. If it is covered by sludge, a fault can occur. It can be cleaned using a water hose.

LEVEL PROBE (if included)

Check the cleaning of the level probe every water change. Sludge or other types of dirt may be present in the probe housing. Be sure to remove any items and clean using a water hose.

SCREEN

Do not use with wet hands or chemical residues. Clean with a cloth and mild soap when necessary. Cleaning with other more aggressive chemicals can cause irreparable damage to the screen.

PNEUMATICS (if included)

Bleed the regulator filter if necessary. Check that the air supply is free of moisture. If moisture enters the pneumatic circuit, the solenoid valve and cylinder can be damaged.

WATERFLOW SYSTEM (if included)

Cleaning the auxiliary tank with each change of water. It is often impregnated with oil that in some cases is dried and accumulated both in the bottom and in the extraction bowl. Clean the filter inside the tank in turn. This can be unscrewed to clean outside of the machine.

FILTERING SYSTEM (if included)

Verify the pump is operating properly taking advantage of the water changes. Clean the filter periodically using the drain valve. Check that the filter bags are in good condition, not broken. Check the gasket. All these operations must be done at a temperature below 104 ° F.

Maintenance periods for standard cleaning:

- Cleaning liquid change: When poor or longer cleaning is observed.
- Check surface emitter status: Each water change
- Emitters cleaning: Each water change.
- Generator cleaning: 1-3 months depending on environmental conditions.
- Electrical cabinet cleaning: 1-3 months depending on environmental conditions.
- Check heat resistance condition: Every change of water.
- Check level probe condition: Every change of water.
- Screen cleaning: When required.
- Purge air filter: When necessary (each case will be different).
- Check air circuit humidity: Daily
- Auxiliary tank cleaning: Every change of water.

POSSIBLE DISFUNCTIONS

1. No power:

- Check the power cord and plug.
- Check the switch and the main supply is possible.
- Check the fuse located on the power plug.
- Replace the fuse if necessary.

2. Indicators do not work.

- Call Service.

3. Ultrasonic cavitation weak:

- Clean the base of the tank of dust and particles.
- Change the water level.
- Empty the tank and refill with clean water.

4. Touch screen (if included)

1. Touch screen does not work.
 - Call Service.
2. A warning of low battery appears on the screen.
 - Change the battery.

5. High temperature warning.

- In the case of the equipment exceeds 90°C / 194°F, ultrasounds and the heating elements will stop. For them to operate again, the temperature should drop at least 5. This may happen when the lid is not open for a long time due to the transducer boxes generate heat that can not dissipate.

6. Communication failure.

- Call Service.

7. Generator (if included)

1. It does not emit US.
 - Check that the partial automatic of the ultrasounds is on.
 - Check for voltage to the generator.
 - If any of the above is correct, call Service.

8. Heating element

1. It does not heat.
 - Check that the partial automatic is on.
 - Check that the setpoint temperature is correct on the display.
 - Check that temperature sensor is in touch with the tank.

9. Pneumatic system (if included)

1. No air in the system.
 - Check that the external air system works.
 - Check that the tap of the filter regulator is the right one for the working pressure.
 - Check that the tap is opened.
 - Check the circuit for leaks.
 - Check that the flow regulator is in the correct position.

10. Movement function (if included)

1. Movement function failure.
 - Check that the cylinder sensors switch on the LED.
 - Check that the flow regulator is in the correct position and not completely closed.
 - Any other disfunction, call Service.

11. WFS and filter (if included)

1. No water movement is appreciated in the system.
 - Check that the supply voltage reaches the pump.
 - The pump is not working. Call Service.
 - Check that the system is clean both at the suction area of the auxiliary tank, and at the intake of the main tank.
 - Check That the rotor of the pump is not blocked.

12. Transducer boxes (if included)

1. They don't emit.
 - Call Service.
2. They don't clean properly.
 - Call Service.

SITUATIONS AND PLACES WHERE THE MACHINE CAN NOT BE USED.

Never use the machine outdoors or in areas with an excessively dirty environment. In case you can not avoid working in dirty environment, proceed to maintenance works more frequently.

TECHNICAL SPECIFICATIONS

1. Power Supply: 230V Monophase + Neutral + Earth.
2. Capacity: 220 liters / 60 gallons
3. Tank built in AISI 304, 2mm / 0,078". thick, Stainless-Steel.
4. Integrated auxiliary tank for lubricants and oil separation, with 40 liters / 10 gal. of capacity.
5. 1 ultrasonic generator with 2000Wp (4000Wp-p) total output power. Working frequency: 40 KHz sweep system $\pm 2\%$.
6. 1 submersible emitter, 2000Wp. Working frequency: 40 KHz. The emitter is equipped with 34 PZT (lead zirconate titanate) transducers with an aluminum alloy body. The emitters are made of 2.5mm / 0,098" INOX AISI 316 steel thick, with a mirror polished finish.
7. 1 heating element 3750 W.
8. Outside panel in 1mm / 0,039" thick fingerprint-resistant steel.
9. ½" BSP auxiliary tank drain draining ball valve, and 1" BSP draining ball valve.
10. 20mm / 0,78" thick K-Flex Duct Net thermal-acoustic insulation.
11. Pneumatic lifting platform for loading, oscillating movement and unloading with a capacity of 200Kg /440Lbs. Air requirements is 85 PSI / Reads 6 bar on Regulator
12. Insulated tank cover in Stainless-Steel.
13. Air blow-gun for drying parts.
14. Compressed air connection: \varnothing 8mm / \varnothing 0,314"
15. 4.3" Touch screen, functional and intuitive access to ultrasound time setting, temperature and peripheral or optional systems; and programmable with weekly calendar. 6 outputs & 8 inputs temperature module PLC.
16. DIMENSIONS (large x wide x high):
 - Internal: 760 x 520 x 390 mm / 29.92 x 20.47 x 23.23 inch.
 - Useful: 730 x 465 x 350 mm / 28.74 x 18.31 x 14.96 inch.
 - External: 1330 x 930 x 1590 mm / 52.36 x 36.62 x 62.60 inch.
17. Filtration system for waste and sludge (optional).

The noise emissions in this machine are less than 65dB.

There are two regulators, the upper one controls the speed of raising the platform while the lower one controls the speed of lowering.

The maximum weight that can be lifted with this machine is indicated in this area.

REGISTERS

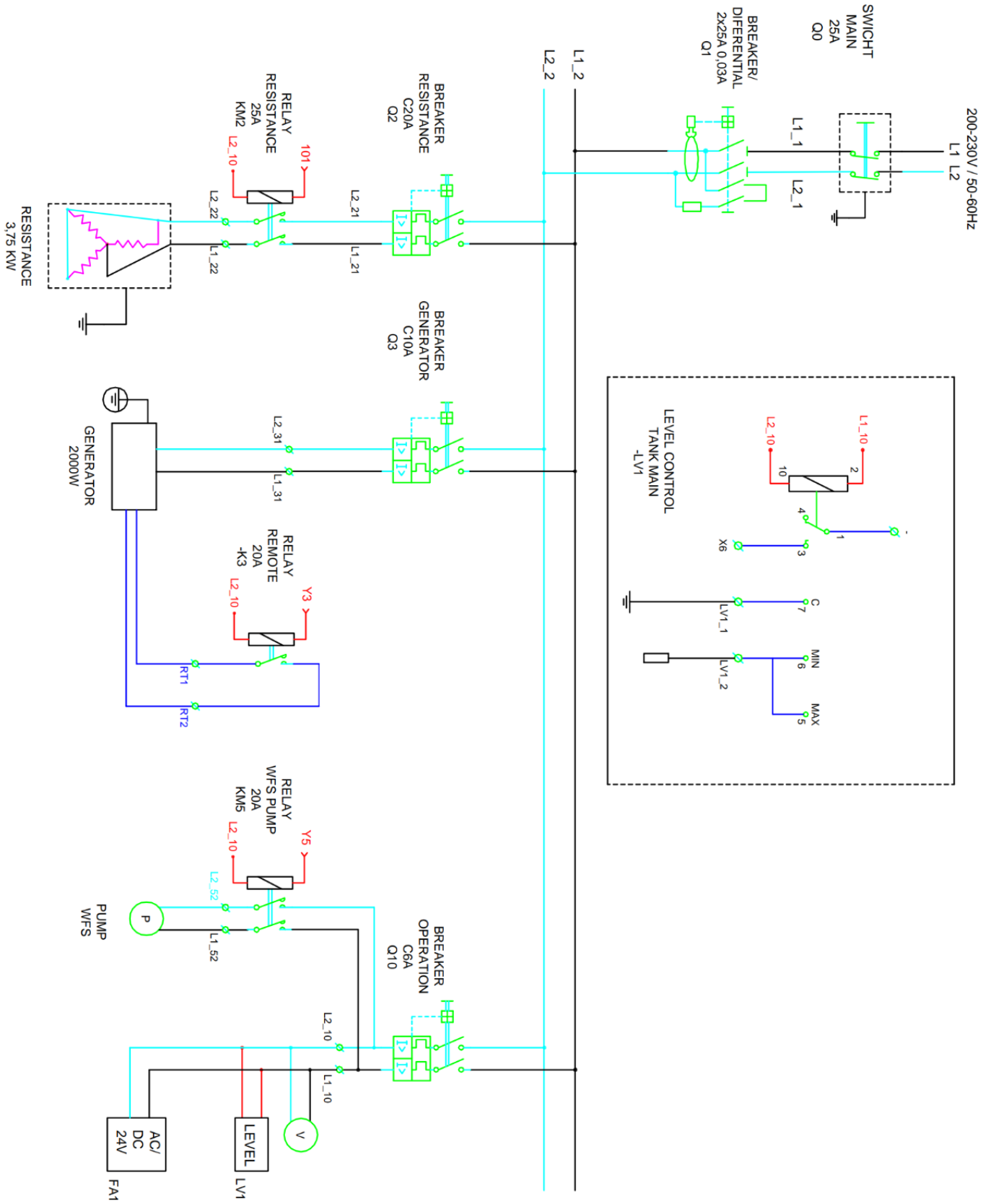
At the rear of the machine: access to the heating element, solenoid valve, temperature sensor, cylinder, cylinder detector..

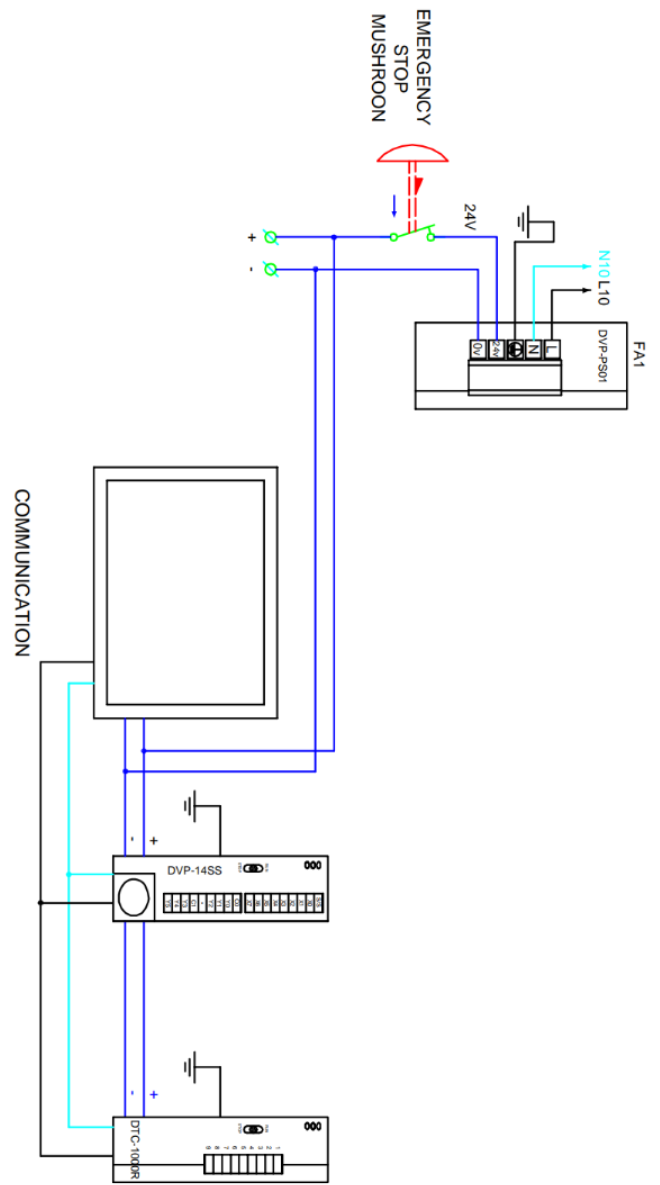
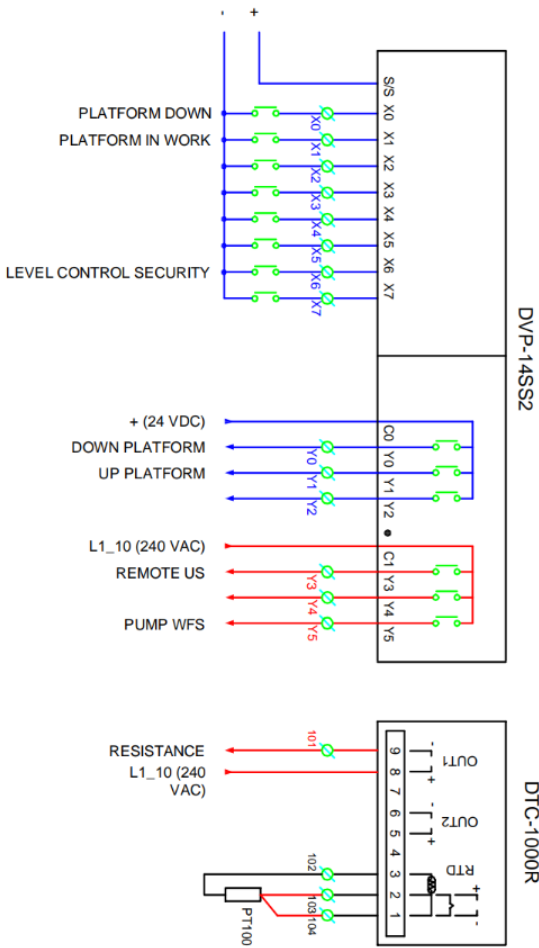
At the front of the machine: access to the pump.

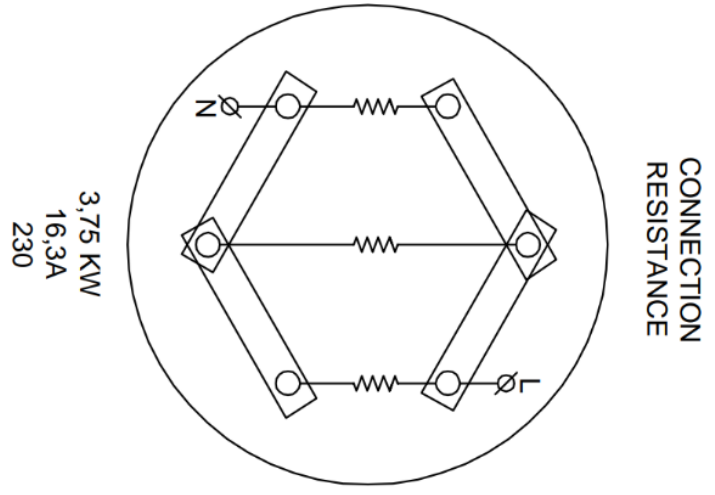
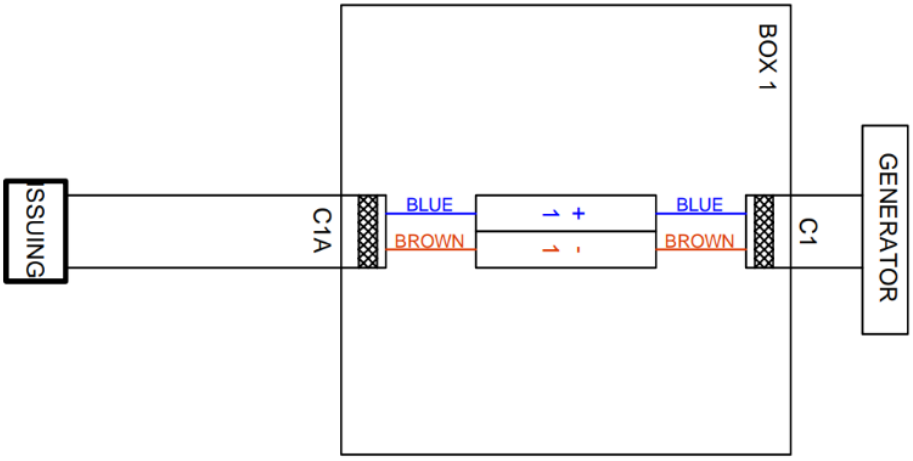
On the left side of the machine: electrical cabinet.

On the right side of the machine: ultrasonic generator.

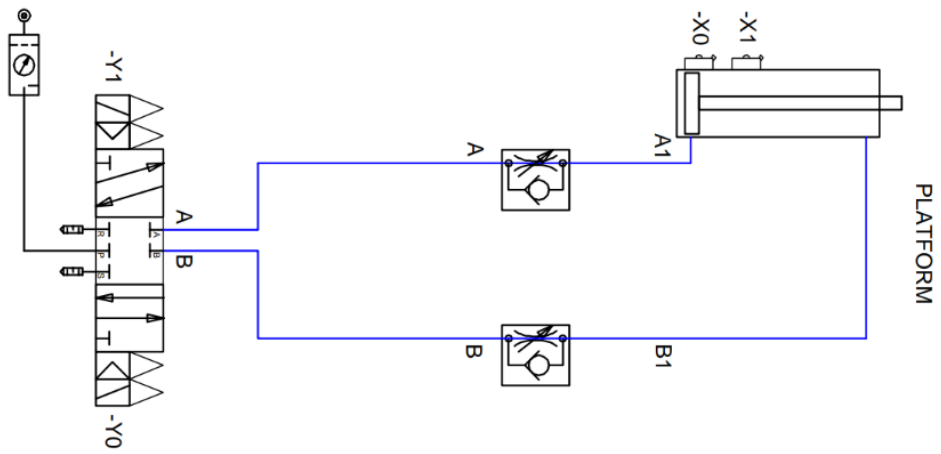
ELECTRICAL AND PNEUMATICS SCHEMES

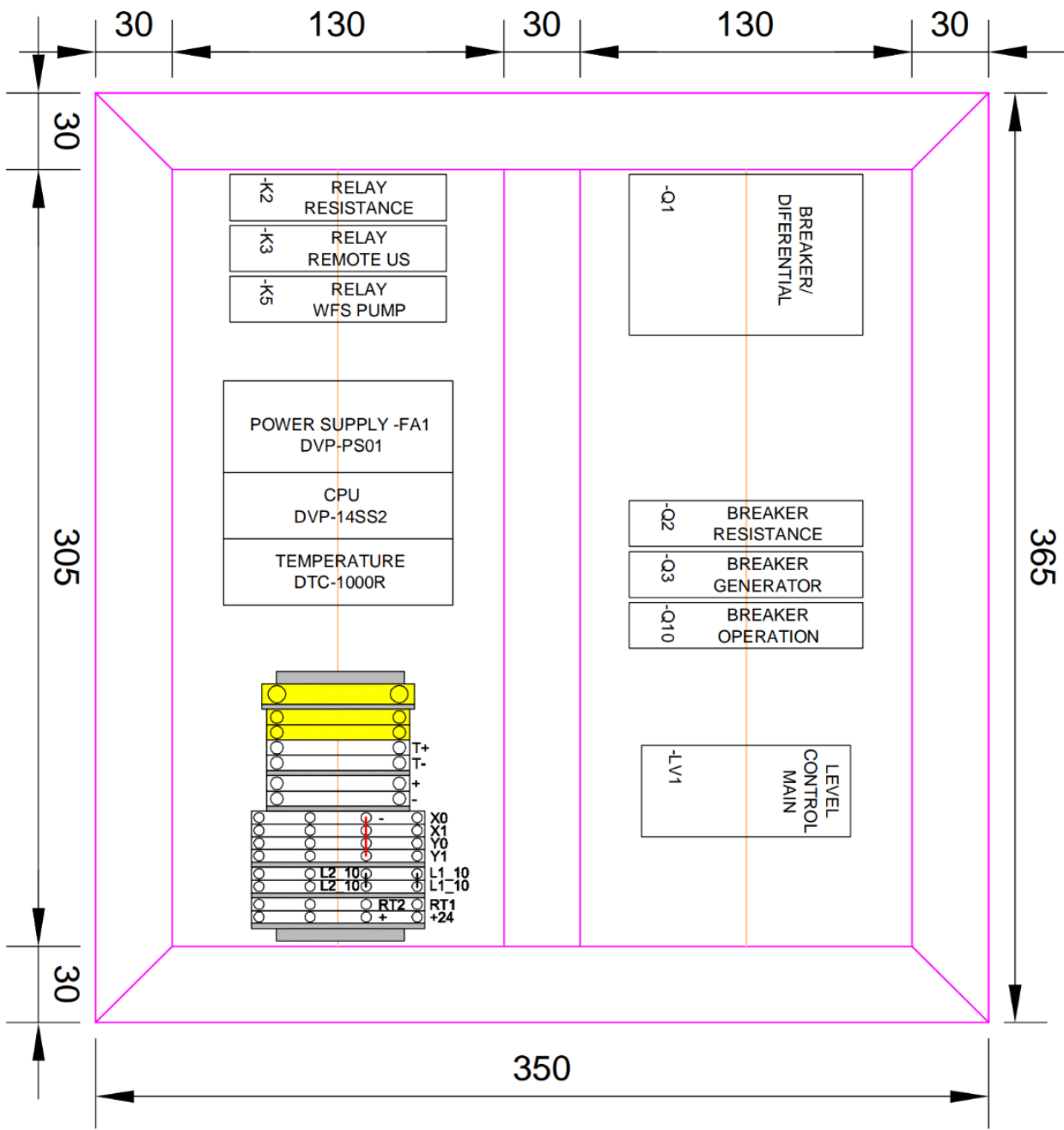






CONNECTION
RESISTANCE





RISK ASSESSMENT

This equipment has built-in ultrasound emitters inside the tanks. Ultrasound are acoustic waves whose frequency is above the hearing capacity of the human ear (approximately 20,000 Hz). Ultrasonic cleaning is a method that uses ultrasounds (generally 15-2000 kHz) and an appropriate cleaning solution. The ultrasonic frequency in this type of work is low.

The health effects of ultrasound, as included in the Technical Note of Prevention 205 are the following:

By contact: mainly manifested in the hands, in cleaning and degreasing operations. There is no such exposure, since the transmission medium is aqueous, that is, the water acts as a shield, with which the transmission of ultrasounds is practically non-existent.

By air: same as the previous point.

Every cleaning operation with this equipment is made with the lid closed, so there is no exposure to ultrasound.

In case of auditory discomfort it would be advisable to use adequate protection (plugs, etc.), although the noise emission values are below the maximum admissible.

Risks that could not be eliminated are analyzed below:

CLASS	SEVERITY (S)
1	Minor injuries. 3 Days maximum of sick leave. First aids.
2	Reversible damages. Between 3 and 30 days of sick leave.
3	Permanent damages. More than 30 days of sick leave.
4	Death. Permanent disability.

CLASS	FREQUENCY (Fr)
2	Never / Almost never / More than 1 year
3	Rarely / More than two weeks and up to 1 year
4	Occasionally / More than 1 day and up to a week
5	Regularly / More than one hour and up to a day
6	Often / Less than one hour

CLASS	PROBABILITY (Pr)	Avoidable (Av)
1	Unlikely, not known or in any case	Avoidable
2	Unlikely to occur	
3	Possible	Likely avoidable
4	Probable	
5	Frequently	Impossible to be avoided

N	Grade (N1)	Class	Risk profile (P)=S+N1-1
14-15	5	6-8	High risk. Correction needed
11-13	4	4-5	Medium risk
8-10	3	1-3	Low risk
5-7	2		
3-4	1		

RISK DESCRIPTION. CORRECTIVE ACTION	Risk assesment					
	S	Fr	Pr	Av	N=Fr+Pr+Av	N1 (P)
Risk of thermal contact with hot parts of the machine, the cleaned part or the cleaning liquid. The risk is duly signposted on the machine at the exit of the cleaning liquid and the use of heat protection gloves is indicated in the users manual.	1	2	1	1	4	1 1
Risk of contact with chemical products (cleaning fluid). In the users manual, is indicated that it should be considered the cleaning products safety data sheets and the use of chemical protective gloves.	1	2	1	1	4	1 1
In the user manual it is indicated that the piece, once cleaned, is left in the basket until the liquid is drained.	1	2	1	1	4	1 1
Risk generated by the transfer of flammable liquids to the cleaning liquid. The users manual indicates that it is necessary to make sure that the part to be cleaned is free of flammable liquids.	1	2	1	1	4	1 1