What are the periodic maintenance operations for Microplan's test benches?

The scope of the following document is to indicate the whole set of ordinary maintenance operations to be periodically executed to ensure the perfect functioning of the test bench over the time and to give the operator instructions on how to do these operations.

All maintenance work must be carried out by highly qualified personnel, equipped with all the necessary tools to protect their safety.

Ordinary maintenance.

The access to all the electric components and to all the parts under voltage of the system is allowed only to a specialized and expert electrician, that must turn off the main switch of the system and remove the power supply to the system prior to perform any maintenance intervention.

To minimize the risk of breakdowns or accidents please comply the following instructions:

- Before using the system, check its perfect functionality and in particular of its safety devices.
- Periodically check the integrity of the electric cables.
- Protect the cables from high temperatures, lubricating and cutting edges. Avoid also twisting and knotting of the cables.
- Use the diagnostic program once a year to check the proper functioning of the pneumatic and the proportional valves.
- Make a copy of the data folders of the system once a week and store them in an external memory device.

The components that need periodic maintenance are:

- Water pressure regulators.
- Pipelines and components on water circuits.
- Electric cabinet fans filters.

Water pressure regulators

The water pressure regulators include an internal cartridge to collect the impurities coming from the water net. If this cartridge gets clogged due to an excessive amount of impurities you will experience negative phenomenon such as a limited water flow-rate.

To prevent these problems a periodic cleaning of the cartridge is required, with a frequency of at least once every month.

Unscrew the transparent cap placed on the rear of the filter to access to the cartridge to cover the filtering element, as shown in the pictures below.

Prior to perform this operation, make sure that all the water inlets of the system are closed.

Extract filtering element taking care not to spoil the gasket. Then eliminate all the impurities from the filtering net with compressed air and wash the component with clean water. At the end of the operation, reassemble all the components taking care to the correct placement of the gasket.

Water filters

There are some filters on the primary heating circuit and on the output of the sanitary circuit to limit the flow of impurities to the boilers under test within the test bench. These filters collect the impurities and they need to be emptied and drained from the impurities at least once weekly.

The typical problem caused by an excessive quantity of impurities in the filters is a water flow drop during the test on heating primary and sanitary circuits.

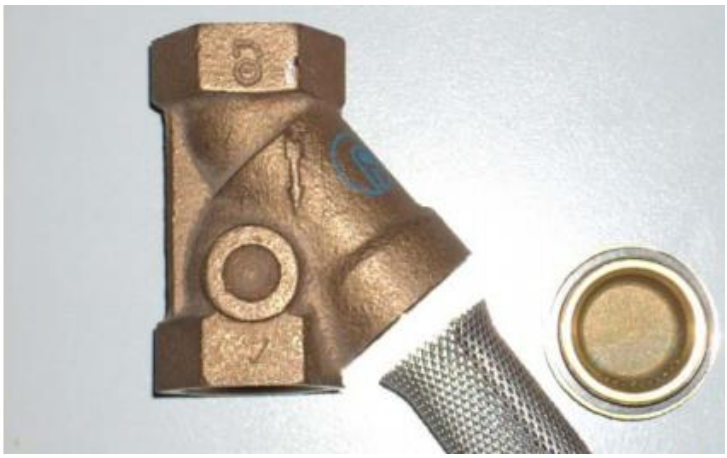
To prevent these problems, it's necessary to proceed with a cleaning of the cartridge placed inside the filter.

To do this it is necessary to operate on the back part of the filter, unscrewing the cap placed to cover the filter element taking care to previously empty the concerned parts of the circuit.

Once the cap is removed proceed with the extraction of the filtering element taking care not to lose the gasket.

Then proceed to eliminate eventual impurities on the filter element through the use of compressed air and washing the component with clean water.

Reassemble all the components, at the end of the operation, taking care to properly place the gasket.

Gas pressure regulators


The gas pressure regulators contain a filtering membrane whose task is to capture the impurities coming from the gas net. If this filtering membrane gets dirty or clogged this means that some impurities are present in the gas supply, and these could potentially damage components located on the gas circuit and especially the gas flow transducer.

To prevent these problems, it is necessary to proceed with the check and cleaning of the filtering membrane placed inside the pressure regulator, at least once annually.

To do this it is necessary to operate on the back part of the pressure regulator unscrewing the cap placed to cover the filtering element taking care to previously close gas bench inputs.

Once the cap is removed proceed with the extraction of the filters.

Then proceed to eliminate all the impurities on the filter element through the use of compressed air.

If you find out a high quantity of impurities or even worse impurities oily composed, proceed with the addition of further filtering elements on the gas inputs of the bench because eventual oily components could compromise the correct functioning of the components of the bench and especially the transducer of the gas flow.

At the end of the operation reassemble all the components, taking care to properly place the gasket.

Pipelines and in line components on water circuits

The limestone contained in the water, because of the heating process during the tests, settles inside the components and pipelines and it gradually limits the functionality of the components.

To remove the limestone from the system it is possible to proceed only in mechanical or chemical ways.

The first solution involves removing (one by one) all the components of the system affected by the limestone deposit and scraping the limestone from them, paying attention not to damage them.

The second solution is to let flow some acidic solutions (similar to those used to clean boilers) inside the circuits in order to corrode the limestone.

This operation has to be made as less as possible and only if the situation becomes critical to prevent to damage the gaskets that are in the circuit, the transducers and the other components of the system.

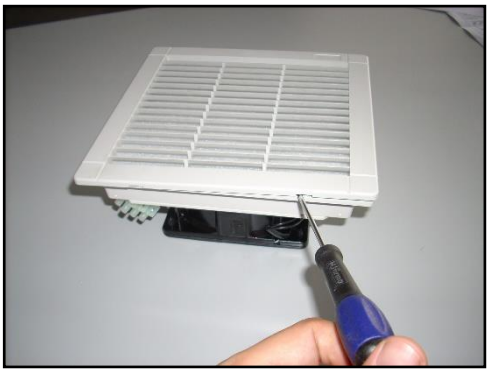
It is suggested to limit the arising of this problem by applying some preventive actions such as:

- Install devices able to destroy the limestone contained in the water on the piping upstraem the inlets of the system.
- Create a water recycling system to reduce the total amount of limestone.

Electric cabinet fans filters

The fans in the electric cabinet are equipped with filters to prevent the dirt entering the cabinet. Over time, these filters may be clogged with dirt, thereby compromising the ventilation. In order to clean them follow this procedure:

- Remove the fan cover grid by using a screwdriver.



- Remove the filter from the protection grid and clean it with a compressed air jet or replace it.

- Refit everything following these instructions in reverse.

Extraordinary maintenance.

The extraordinary maintenance is essentially necessary when a component failure of the hydraulic section of the bench occurs, or in presence of a problem to an electrical component in the electrical cabinet.

Usually the only solution is to replace the faulty component with a new one. For this reason, we suggest periodically to check the availability, the condition and the location in the warehouse of the spare parts, and to check the availability of the spare fuses inside the electrical cabinet.

It is possible to request new components to *Microplan*, in this case please consider shipping and delivery time. The procurement in advance of critical parts is recommended.

Replace or calibrate a transducer.

Every time a new calibration is performed, or a measuring instrument is replaced, an editing step will have to be performed. As a matter of fact, every transducer has its own technical features, such as engineering scale, output signal, etc. and these same features have to be entered into the software of the bench to let a correct reading. Moreover, brand new measuring transducers of the test bench are usually delivered with their own calibration certificate and Microplan's technicians elaborate it, before the test benches leave the factory, through the software of the single test bench, so that the final error of each transducer is compensated.

Every time a transducer is replaced or re-calibrated a qualified technician has to edit in the conversion tables of the software the new factors based on the new calibration certificates.

Moreover, when installing software updates, received from Microplan, be careful not to overwrite the calibration files.

For any further information please contact Microplan support.

In case of complex issues, do not hesitate to contact us opening a *Ticket*; it is the principal and easiest way to receive our support.

Please include in the ticket the *Serial Number* of the test bench as you can find in the CE label. The CE label is located on the right side of electric cabinet.

Control PC.

The control PC of the system must be used only by authorized personnel and only for purposes directly linked to the system use.

It is forbidden to change any PC setting or to install on the PC any other software without Microplan's permission.

Microplan S.r.l. is not responsible for any use of the control PC not compliant to what described in the user manual.

To limit the problems caused by a control PC failure, we suggest to make a copy of the data folders of the system once a week and store them in an external memory device. For more informations consult the *Data back-up* file in this section of the manual.