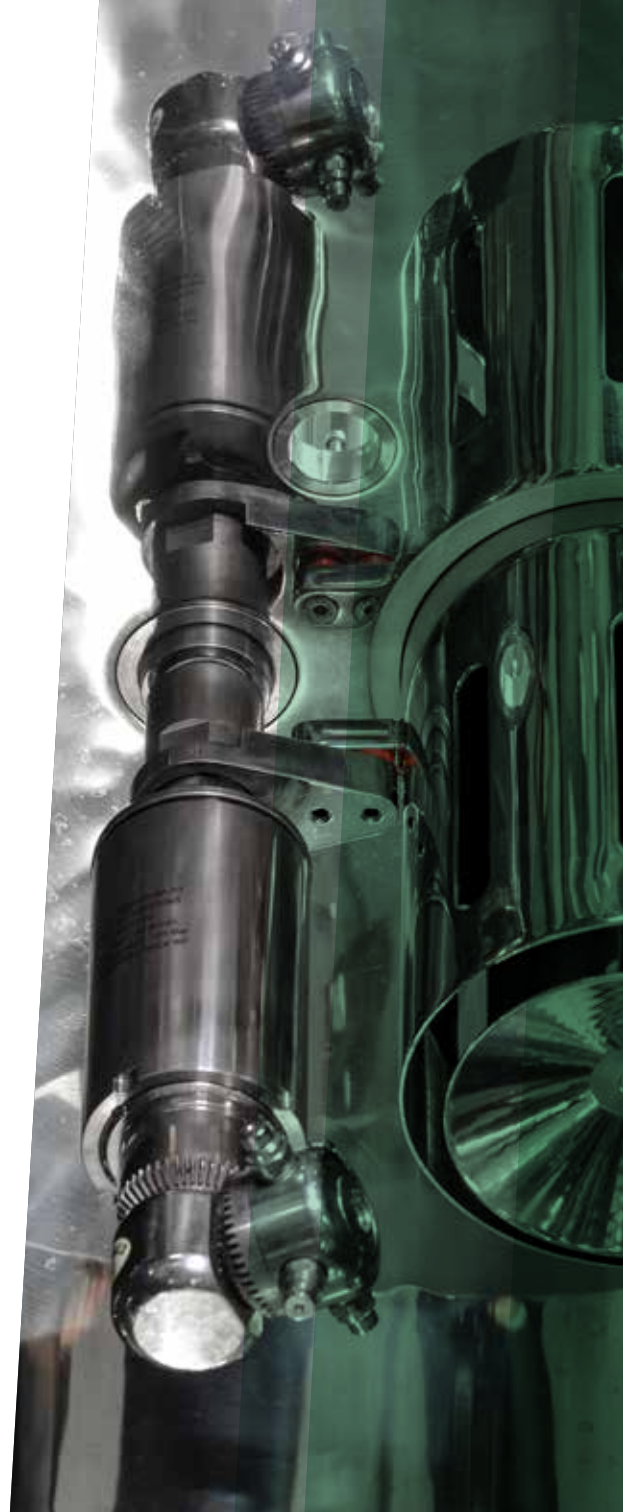


# WASHING



## Automatic bin washing cabin

The washing stations we propose have the following general characteristics.

The available utilities are:

- » city water;
- » purified water;
- » compressed air;
- » steam for the air handling unit,
- » electricity.

MWS washing machines are designed according to a “modular scheme”. This means that the system is composed of distinct elements: some “options” can be added to a “basic version” to obtain different configurations with various levels of automation. This allows all needs to be satisfied.

Increasingly sophisticated features and performances can be obtained by adding several optional groups to the basic version, with the possibility of washing with different types of water, low or high pressure, using one or more cleaning products, heating, steam washing fluids (in line) or with electric heating elements.



The complete system offered consists of:

- » pumping group;
- » washing cabin;
- » AHU (Air Handling Unit).

We will describe all characteristics of each group in the following paragraphs.

The machine has an advanced HMI through which the operator can manage the data and, thanks to the SCADA system, he can control the user domain and manages reporting.

Internally the cabin is mirror polished with grounded weldings.

Some possible options are:

- » more cleaning groups;
- » water recirculation group;
- » conductivity and/or PH control transmitter at the discharge line.

The automation is based on a local SCADA to manage recipes and 21 CFR part 11.

The hydro pumping group will be on the free side of the washing cabin in technical zone.







**Pumping  
group**

The MWS Hydro System group can manage the washing cycles in a completely automated way with the possibility to set the different process parameters.

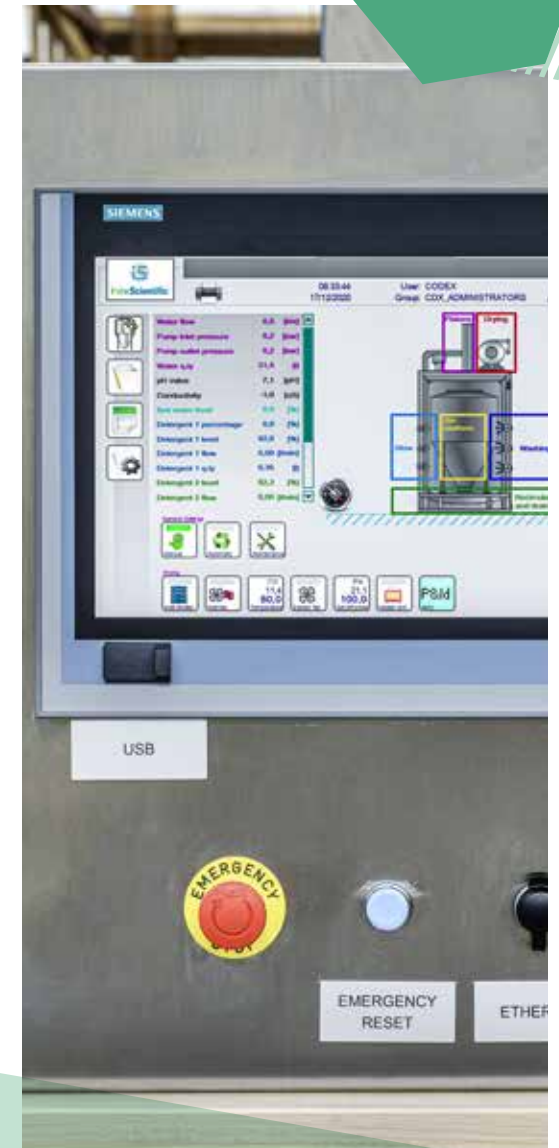
The MWS Hydro System pumping group consists of a set of components that are necessary to obtain the pressurization of the washing fluids up to 70 bar.

The unit is installed on a fixed frame in AISI 304 stainless steel and consists of:

- » a high or low pressure pump with a flow rate starting from 40 l/min up to 100 l/min, equipped with an automatic control system with inverter;
- » a flow rate and a pressure transducer;
- » an intake manifold with three connections (tap water + purified water + compressed air) and anti-contamination safety system with double valve and intermediate drainage for the purified water line.

All connections and fittings are flanged type. The pneumatic valves are in AISI 316 stainless steel.

Each part in contact with the washing liquid is made by AISI 316 stainless steel and mirror polished.







A detergent storage tank of 25l is installed on the pumping group. Two probes check the detergent level and communicate to the operator, through the HMI, when he needs to refill the tank. To refill the tank, a volumetric pump is used. The operator can connect a suction pipe in the quick connection in the front side of the machine.

A 100 liter demi-water storage tank can be used to store water in case of a purified water flow available too low.

The outputs of the pressurization unit will be directed towards an hydrokinetic head and a set of nozzles that perform the washing of the IBC inside the washing cabin.

The expected standard controls are:

- » inlet water pressure;
- » inlet compressed air pressure;
- » outlet water flow rate downstream of the pump;
- » outlet water temperature downstream of the pump.

On the drain line of the cabin can be installed, on request, a conductivity probe and a PH control probe which verifies the features of the water at the end of rinsing phase with purified water.

## Dimensions and utilities.

- » Outlet pressure: 6-70 bar.
- » Mains water flow rate: 40-100 l/min.
- » Degree of maximum hardness: 5 ° f.
- » Water flow PW: 40 l/min minimum.
- » Water inlet pressure: min. 1 bar; max. 3 bar.
- » Compressed air flow rate: 500 NI/min.
- » Compressed air pressure: min. 3 bar; max. 8 bar.
- » Voltage: 400 V, 3-phase, 50 Hz or 440 V, 3-phase, 60 Hz.
- » Installed electrical power: to be confirmed with the design.
- » Cabin footprint: 2100 mm x 2100 mm.

Inside the pressurization group it is possible to install a single or double detergent dosing group (on request). The dosing group is equipped with a flow rate transmitter so the PLC can adjust the flow rate of the pump with an analog signal.







## Washing cabin

The IBC can be placed on a pallet jack and be brought in through the front door. The machine will be installed with the lower part of the structure under the floor level to ensure that the IBC reaches the right height to go in and out the cabin.

It will be built in Aisi 316 for all parts in contact with the wash water and in Aisi 304 for non-contact parts. The cabin internal finish will be mirror polished with removed weldings.

The entrance door will be manually opened. The seal is guaranteed by an inflatable seal. A double door will be provided for access to the clean zone (on request).

The washing cabin has got one or two ramp nozzles in order to wash all external surfaces in combination with the rotating platform placed on the bottom of the cabin. To be able to cover all parts of the Bins in a uniform way, without blind points.

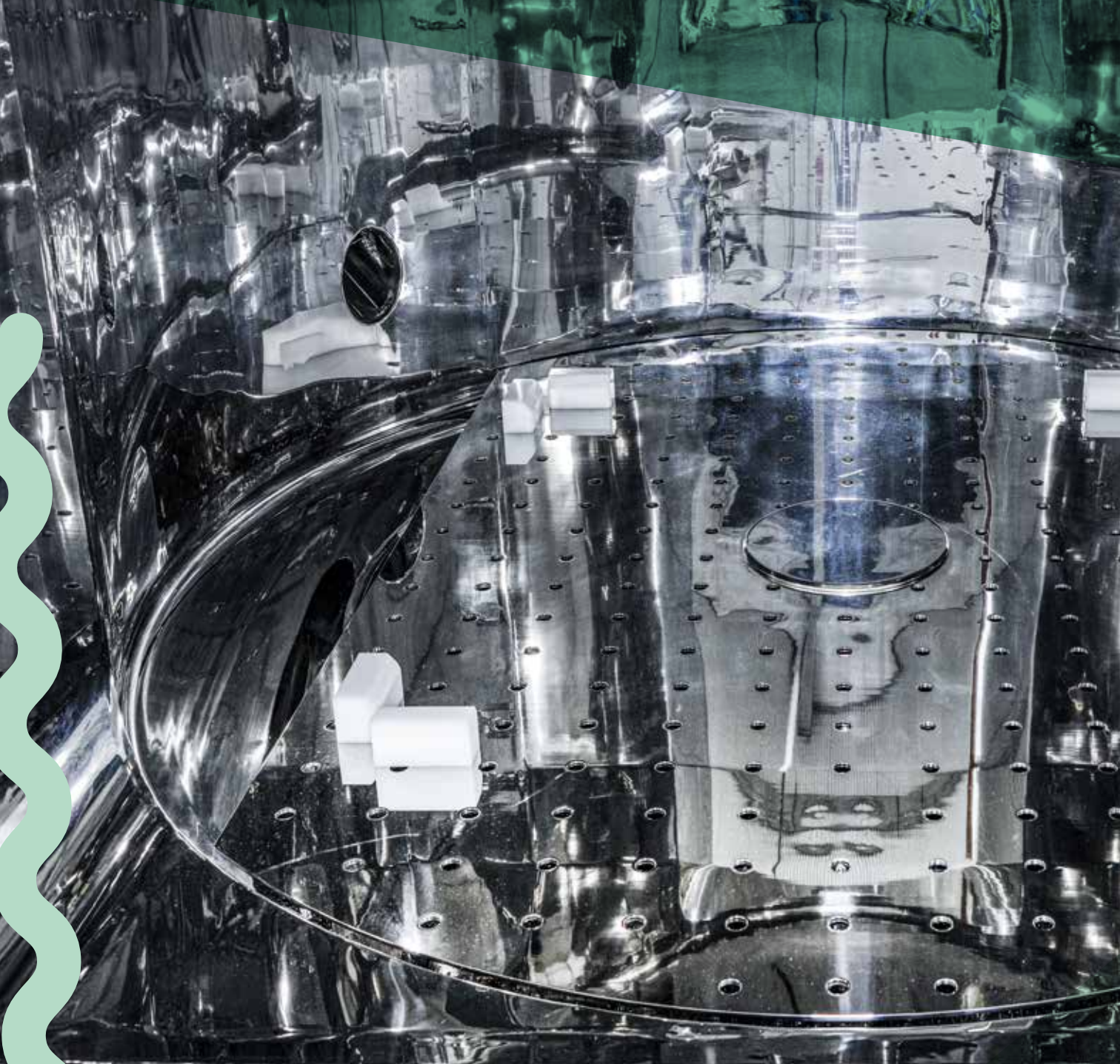
The IBC internal surfaces are washed by a 360° hydrokinetic head with orbital movement installed on a telescopic pipe that brings the washing head to the right height.



On the telescopic pipe, a sensor is installed to check the IBC presence inside the cabin.

A fan to extract the exhausted air, during drying phase, is positioned on the cabin and the inlet and outlet connections of the drying air are DN300, both positioned on the upper part of the cabin itself.





## AHU - Air handling unit

The AHU for drying will have the ability to manage the heating of the drying air via a steam exchanger and will be installed in the technical area. The drying will be carried out thanks to an air handling unit installed in the technical area. The volume of air treated will be 2500 m<sup>3</sup>/h with air sampling in the technical room. The flow rate data is that for a standard version AHU, it will be possible to upgrade the AHU to 5000 m<sup>3</sup>/h.

The AHU that manages the drying is a central unit consisting of:

- » inlet pocket filter class G4 + rigid pocket filter F9;
- » fan with capacity 2500 m<sup>3</sup>/h motor power 2,5 kW controlled by 0-10V signal;
- » controlled steam heating coil with modulating valve for steam entering the heating coil;
- » camfil H14 absolute filter in exit.

All filters are controlled by a 50-500 Pa differential pressure switch.

In addition, the system can also control the flow and temperature of the outgoing air.



## Power and control hardware supply

The power switchboard can be installed in the technical area inside of the machine on the free side of the washing cabin and it contains all the electromechanical elements for managing the activation and the pumps starter.

Moreover, we will install a PLC with the I/O modules and all connections to put the machine in the manufacturing net to exchange data.

The PLC will be from Siemens as standard but Allen Bradley can be applied.

The signal exchange between the peripheral devices will be by profinet for the maximum flexibility and reliability of the system.

A PC, installed on the front side of the cabin, will manage the HMI panel.

UPS system (Uninterruptible Power Supply) can be included and provides emergency in case of power failure, the machine keeps working for a certain amount of time, thus avoiding damage or loss of data.





## Software design

The machine software has got a module structure and it could manage a couple of washing cabins.

The control will be designed on SCADA system to manage recipes, data history reports and 21CFR part.11.

It will be possible to set up reports and make all data available in the manufacturing net on preset paths defined.

## Documents provided

The standard documentation provided by Bimech with the machine is the following:

- » lay-out;
- » P&ID;

user and maintenance manuals included;

1. nstallation manual and interconnecting schemes with all information related to freight, handling and storage of the machine;
2. operator manual with all information related to the use of the machine;
3. maintenance manual with all information related to the execution and the frequency of the ordinary maintenance operations that have to be made on the machine;
4. HMI manual;



- » drawings and list of components;
- » main components data sheet;
- » certificates 3.1. for materials in contact with the washing fluid
- » electrical scheme;
- » pneumatic scheme;
- » recommended spare parts list;
- » IQ/OQ protocols for FAT/SAT.



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