Special Plastic Module for
semiconductor industry

S.P.M. s.r.l.

Chemicals Distributions Systems

Chemicals

Transport trolley

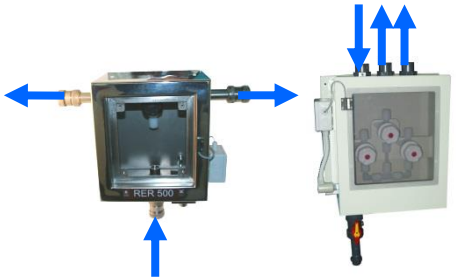
External

Chemicals passthrought

Chemical building – Clean room

CDS

Double or triple piping lines installation and test



Derivation boxes and TEE boxes for piping lines split in multiple directions

Union boxes for piping lines junction

VMB for multiple P.O.U. connection

Chemical distribution

- Filling bottle(1-5L)
- Canister 25-50L
- Drum 200L

→ CDS

- IBC container

→ BCDS

Premixing unit

- Semiautomatic volumetric version, on-line or inside the machine
- Automatic dosing system with magnetic valve ruled by PLC and Touch screen
- Semiautomatic version with PNE syringe
- Balance system for liquid or solid

Trolley for distribution

- Trolley for drum or canister – Manual version
- Trolley with elevator for drum and IBC – Manual operation or semiautomatic version

Components for distribution lines

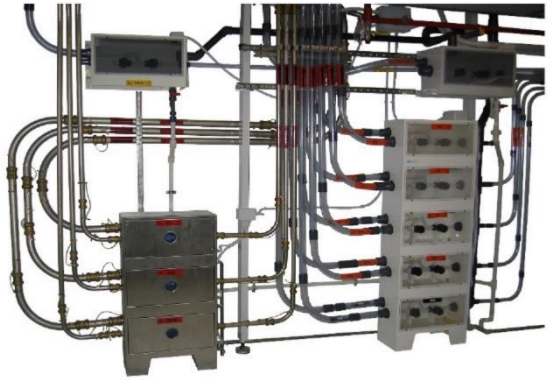
- Triple or double tubes lines
- Tee boxes
- Supervision for chemical distribution implants
- Derivation boxes with or without valves
- VMB
- Point of use module for chemical test

CDS

Premixing

Trolley

Components for distribution lines



The first selection depend on chemical type:

Acids - Alkalines

Solvents

CDS – Chemical Distribution systems can be realized in different versions according to customer needs and chemical type. For solvents we normally adopt stainless steel materials according with safety rules in term of anti-fire protection. With Acids we use specific corrosion resistant plastics materials. In both case we use just high performance material that guaranteed no chemical contamination or degradation.

The second selection depend on chemical media:

1000 liters IBC Container

200 liters Drums

Canisters and bottles

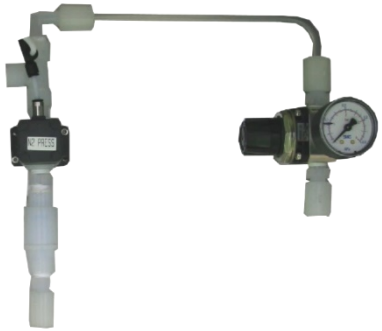
SPM CDS can be realized in order to distribute chemicals into the fab starting from 1000 liters IBC containers, 200 liters drums, canisters and bottles with different capacity.

The third selection is the distribution method:

Diaphragm pumps

Centrigugal pumps

Magnetic levitation pumps



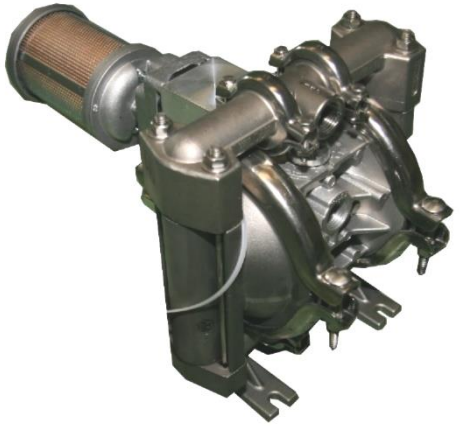
N2 Prezurization

We normally install redundant pumps in order to guaranteed the continous distribution to point of use even with one pump fault.

Air operated diaphragm pumps are reciprocating pumps where the working elements are flexible diaphragms. The drive is by means of compressed air acting directly upon the diaphragm.

Diaphragm pumps:

- have good suction lift characteristics
- can handle sludges and slurries with a relatively high amount of grit and solid content.
- have good dry running characteristics.
- are low-shear pumps.
- can be up to 97% efficient.
- have good self priming capabilities.
- can handle highly viscous liquids.
- cause a pulsating flow



It's possible to use different pump materials according with chemicals:

Polyethylen (PE)

PE is very tough and exceptionally resistant to wear, has low water absorption capacity and displays good general resistance to chemicals. Only such strong oxidants as nitric acid, oleum and halogens can damage PE. For explosion-proof areas (ATEX conformity) and for flammable liquids, PE conductive as housing material is available.

Polytetrafluorethylen (PTFE)

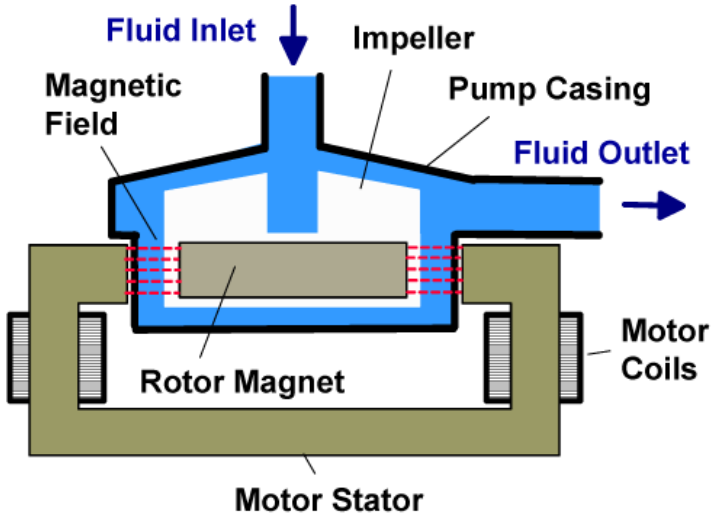
PTFE has a smooth surface, very low friction coefficient, is physiologically safe, can be used over a wide range of temperatures and displays virtually universal resistance to chemicals. For explosion-proof areas (ATEX conformity) and for flammable liquids, PTFE conductive as housing material is available.

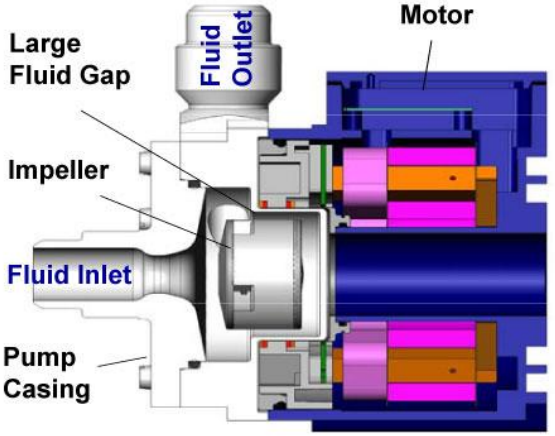
Stainless Steel

Stainless steel 1.4408/SS316 (G-X 6 CrNiMo 18 10) is a cast steel that is resistant to corrosion and acids and is frequently used for fittings and pump casings because of its good general chemical stability.

System Benefits:

- Extremely low particle generation due to the absence of mechanically contacting parts
- Increased equipment uptime
- Lower maintenance costs by eliminating valves, bearings, rotating seals and costly rebuilds
- Reduced risk of contamination due to the self-contained design with magnetic bearings
- Very gentle to sensitive fluids due to low-shear design
- No narrow gaps and fissures where particles or microorganisms could be entrapped
- Smooth, continuous flow without pressure pulsation
- Electronic speed control
- Compact design compared to pneumatic and magdrive pumps. Saves valuable space in process tools by having a smaller footprint
- Proven technology in medical and semiconductor industry (MTBF 50-100 years)





LEVITRONIX®

The fourth selection regards valves:

Metal free valve

SPM Valve

Stainless steel valve

We normally install air operated or manual valves. We use membrane, ball and butterfly valve according to needed flow/pressure and chemical characterization. For high purity we install metal free valve that are completely realized in plastic material.

The fifth selection regards the amount of chemical reserve:

Day tank

Double drum/IBC

Single drum/IBC

Basic system is composed with a drum/IBC housing and a pump that distribute directly from it without any reserve of chemical. For increase reserve and to avoid non stop during drum/IBC changing we install a day tank and or a second drum/IBC housing.

The sixth selection regards the general control philosophy:

Fully Integrated

Separated according to ATEX rules

Remote station controls several CDS

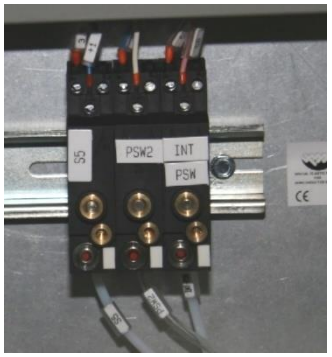
Basic system is just composed with buttons and led for indications. Normally we provide a touch screen that permit to have the full control of the CDS. Is it possible also to provide one unique touch screen that controls more CDS remotely. We can provide also supervision software connected to your network.

OMRON PLC

SMC pneumatic electrovalves

OMRON Safety relay for emergency management

OMRON 5”-8”-10” Touch screen with specific software

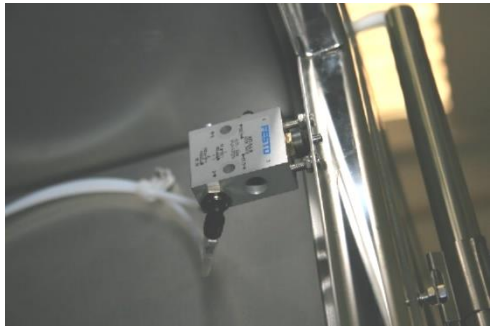


CDA (and N2) pressure switches

Exhaust differential pressure switch

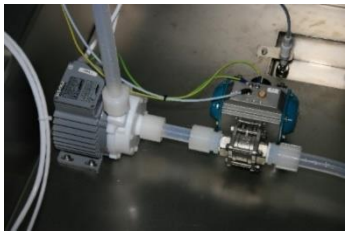
PLC control entire function of the CDS. From the touch screen is possible to check the status of the system, change settings and do maintenance operations. All CDS are provided with emergency button controlled by safety relays.

Atex



Doors opening sensor in pneumatic version

Neon lamp(s) in ATEX version



Special air valves ,Magnetic Levitation or Diaphragm pumps in ATEX version

Fire detection sensor fully ATEX compliant

Pressure and Flow sensors ATEX compliant

Intrinsic safety barrier for electrical sensor power ATEX compliant

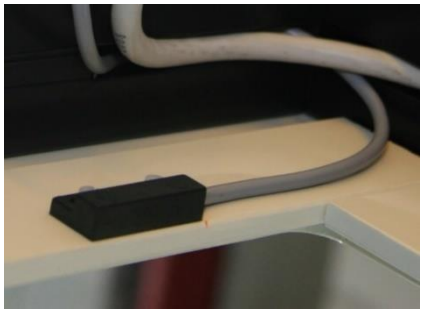
We can build our equipment referring to ATEX rules. In this case we will use only pneumatic and/or certified components.

Some particular:

Metallic parts protection

Plastic rollers for easy drum access (removable platform for cleaning)

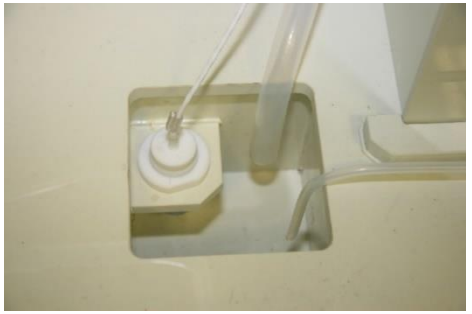
Inline capacitive sensor to detect empty drum



Doors opening sensor

PFA Spray gun(s) for cleaning with H2ODI

Quick connector handler with drops collection



Leak detection sensor

LED lamp(s) available also in yellow

Options:

Exhaust Control

Bar Code Reader

Agitation

UPS

Sample Test

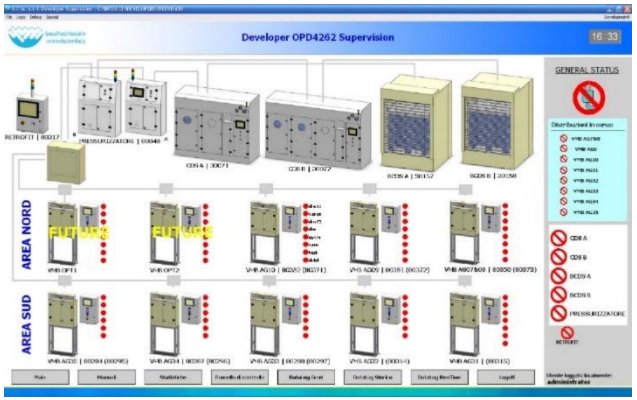
Filters

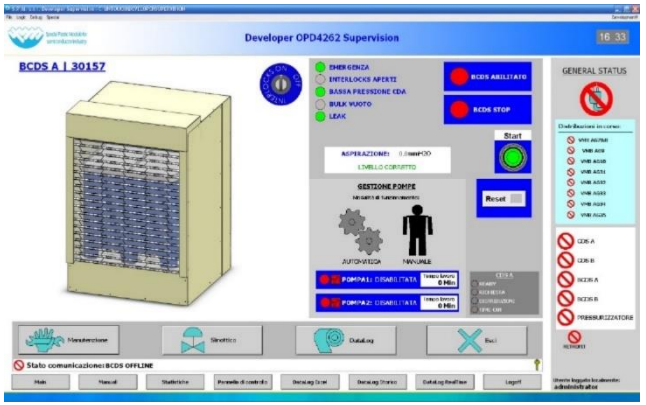
Pressure, Flow, Volume Sensors

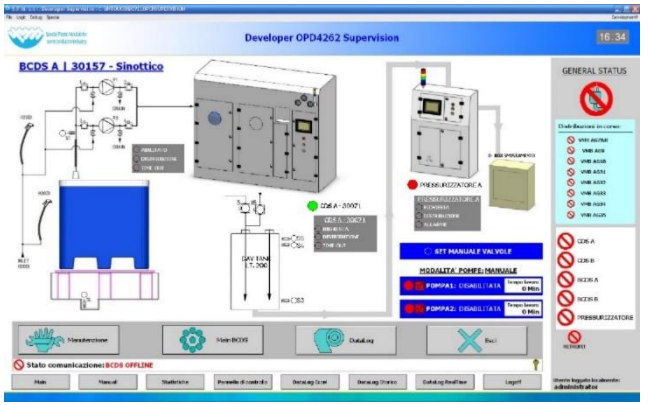
Anti-Fire systems

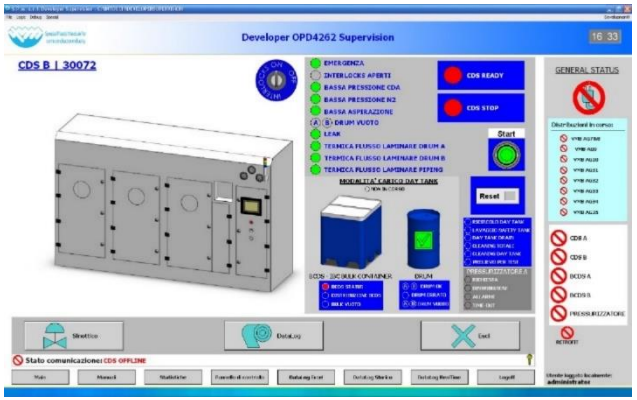
We can equip our CDS with a lot of optional items in order to perform specific customer/chemical needs. We normally install bar-code reader to monitor the correct chemical load, exhaust control to reduce air consumption, agitation to keep on move the solution, filters and a lot of specific sensors.

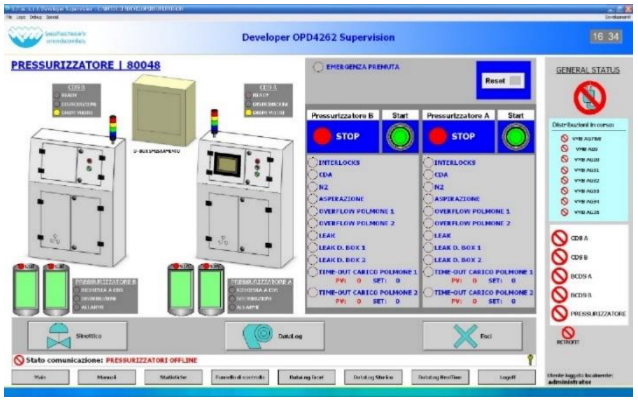
Supervision Systems

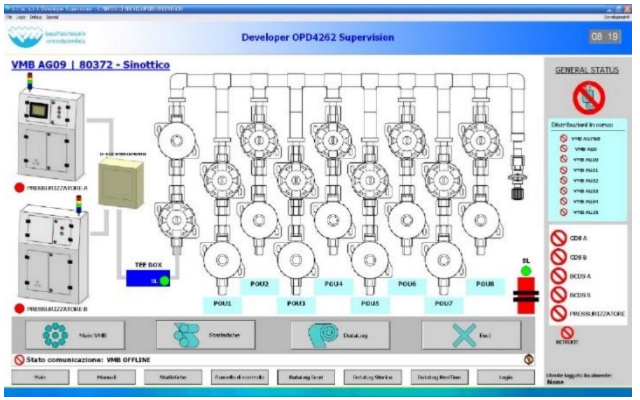






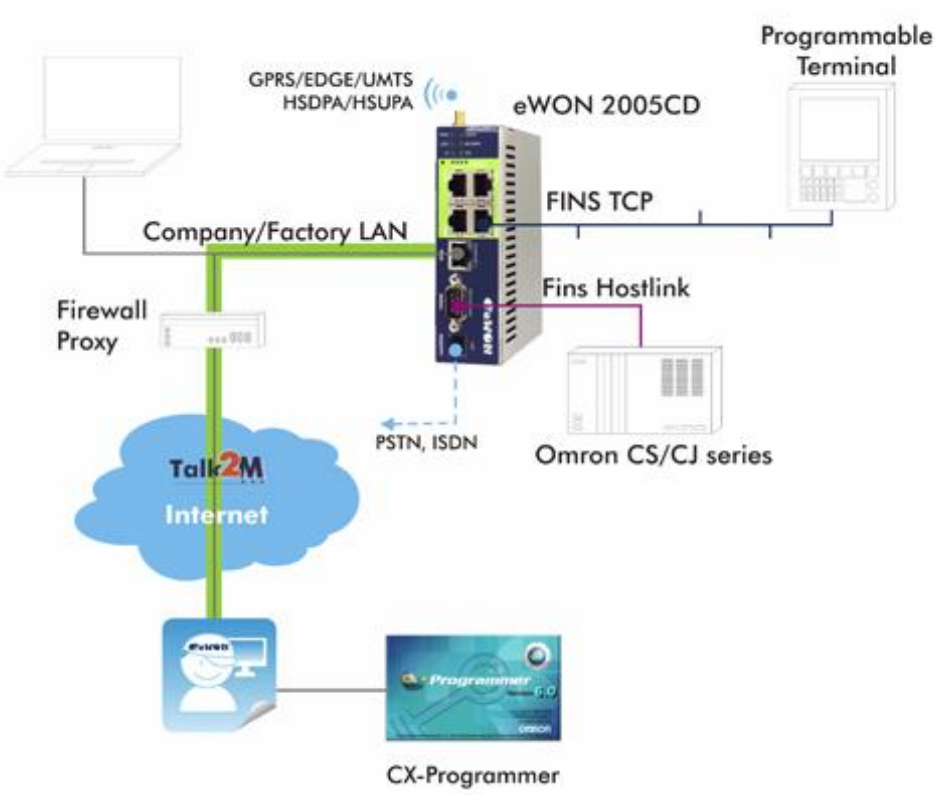






We can provide the full distribution implant supervision software fully customizable with your needs, with multiple access stations developed with Wonderware Intouch or Progea Movicon.

Remote Assistance

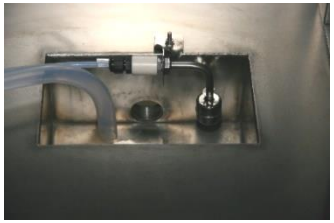


We can provide our equipment with an industrial VPN router in order to establish a remote connection that permit to us to check and modify PLC software.This links is totally secure, in fact is based on a encrypted OpenVPN (SSL 128bit) between Talk2M servers (eWon) and your fab.

IBC Container BCDS

1000 Liters IBC Container: RER600 chemical distribution system

SS304 structure with pneumatical up\dw enclosure; SS316 Day Tank with analog volume sensor; PFA piping; SS316 and Metal free valves; Redundant magnetic levitation pumps for distribution; Pressure and flow sensors.

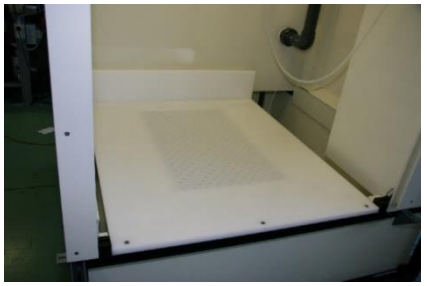


1000 Liters IBC Container: IPA chemical distribution system

SS304 Structure with pneumatical up\dw enclosure; SS316 Day Tank with analog volume sensor; PFA piping; Metal free valves; Redundant SS316 Diaphragm pumps for distribution.

Double 1000 Liters IBCs Container: OPD4262 chemical distribution system

Epoxy painted alluminium structure covered with FM4910 listed plastic panels with electrical up\dw transparent enclosure; PFA piping; Metal free valves; Redundant PFTE Diaphragm pumps for distribution.



1000 Liters IBC Container: H2SO4 chemical distribution system

Epoxy painted alluminium structure covered with FM4910 listed plastic panels with electrical up\dw transparent enclosure; PFA piping; Metal free valves; Redundant PFTE Diaphragm pumps for distribution and one for drain underfloor safety tank.

Drums CDS

200 Liters Drum: HNO3 simple chemical distribution system

PPS plastic structure; PFA piping; SPM valves; Single PE Diaphragm pump for distribution; 50 Liters small day tank, Remote touch screen control for 4 CDSs.

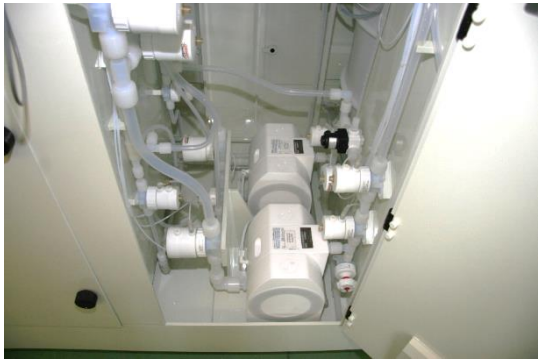
CDS for 200 lt. Drums

200 Liters Drum: HNO3 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 200 Liters Day tank; Redundant PFTE Diaphragm pumps for distribution and one for drain safety tank.

200 Liters Drum: H2SO4 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 200 Liters Day tank; Redundant PFTE Diaphragm pumps for distribution.



200 Liters Drum: H2SO4 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 200 Liters Day tank; Redundant PFTE Diaphragm pumps for distribution.

200 Liters Drum: Microstrip 3001 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 200 Liters Day tank; Redundant PFTE Diaphragm pumps for distribution, Remote control.

CDS for 200 lt. Drums

200 Liters Drum: KOH, HF, HNO3, HCL simple chemical distribution system

PPS plastic structure; PFA piping; SPM valves; Single PE Diaphragm pump for distribution; 50 Liters small day tank, Remote touch screen control for 4 CDSs.

CDS for 200 lt. Drums

Double 200 Liters Drums: EKC 520 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; One PFTE Diaphragm pumps for distribution for each drum, one pump for safety drain, filters.

CDS for 200 lt. Drums

Double 200 Liters Drums: DEFREKLE – E6 chemicals distribution system

FM4910 listed plastic structure; PFA piping; SPM valves; One PFTE Diaphragm pumps for distribution for each drum, one pump for safety drain, filters.

CDS for 200 lt. Drums

200 Liters Drum: HFE-7100 chemical distribution system

SS304 Stainless Steel structure; PTFE free piping -> HFE-7100 incompatible with fluorinated materials; Magnetic levitation pump for distribution, flowmeter, 200 liters day tank and drum balance for level monitoring.

Canisters - Bottles CDS

CDS for Canisters

Double 50 Liters Canister: ESC 784 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; Redundant magnetic levitation pumps for distribution, 50 Liters day tank, PFTE Diaphragm pumps for day tank filling,pump for safety drain, flow sensor and filter.

50 Liters Canister: SLURRY high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 50 Liters Day tank; Magnetic levitation pump for distribution, electrical agitation with variable speeds, filter and flowmeter.

CDS for Canisters

50 Liters Canister: EKC 520 high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; 50 Liters Day tank; Redundant Diaphragm pumps for distribution, filter.

CDS for Canisters

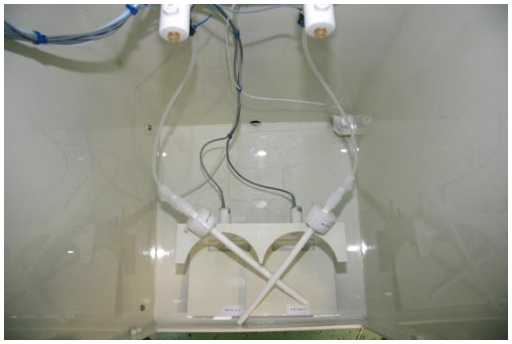
50 Liters Canister: Au Strike high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; Diaphragm PTFE pump for distribution; hoses for external canister connection.

50 Liters Canister: IPA chemical distribution system

SS304 structure; PFA piping; distribution: pressurization with N2.

CDS for Bottles

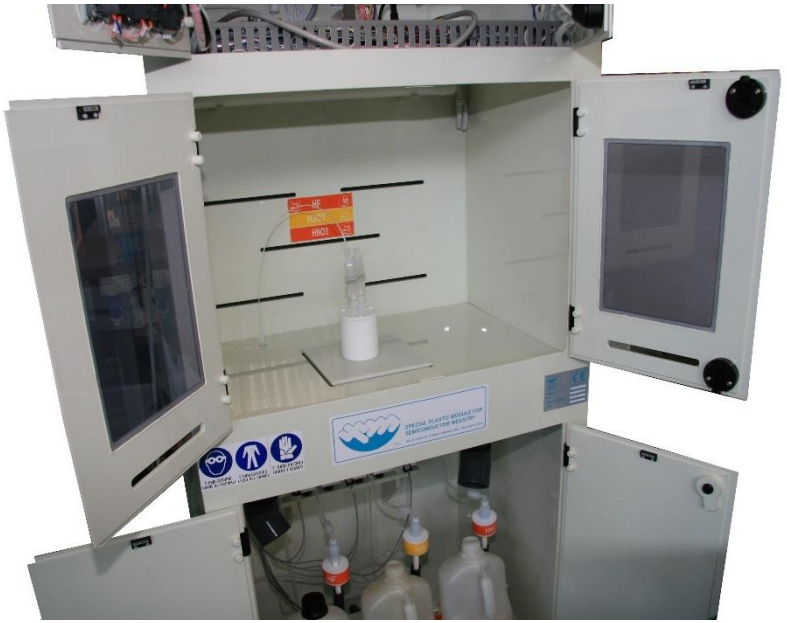


Double 5 Liters Bottles: H2SO4, KOH, XENOLITE Pd replinesher RS, XENOLITE Pd reducer RS and XENOLITE Pd Make Up RS high purity chemical distribution system

FM4910 listed plastic structure; PFA piping; Metal free valves; PFTE Diaphragm pumps and unique control for all the modules.

Premixing

Premixing - Balance



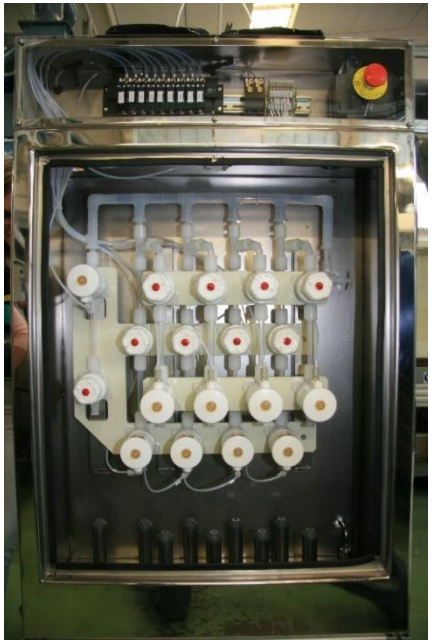
Premixing system for 3 chemicals: HF + H2O2+ HNO3 from bottles. Dosing using a balance. 3 small diaphragm pumps (one for each bottle). PFA pipings.

Premixing - Balance

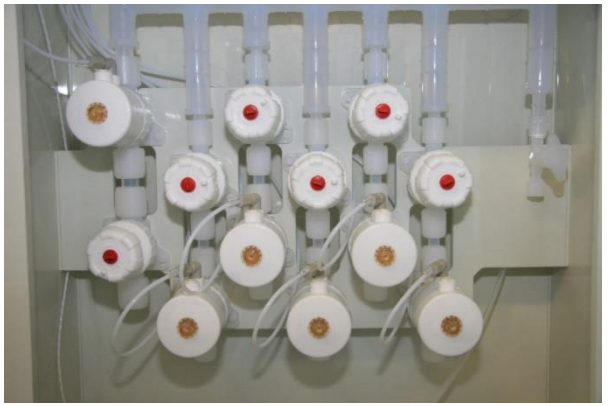
Premixing system for 2 SLURRY from drums. Dosing using a balance under the mixing tank. Diaphragm pumps, Metal free valves,PFA pipings and agitation system.

Components for distribution lines

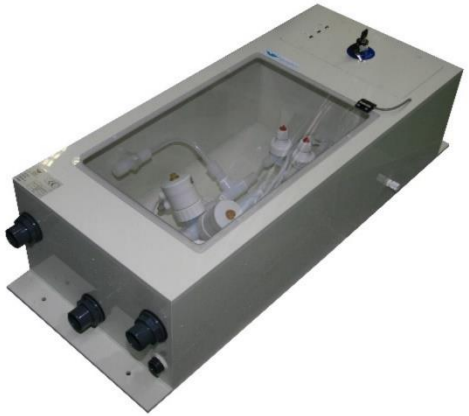
VMB

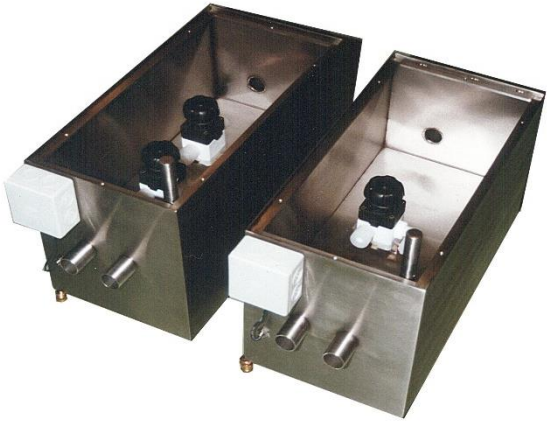


VMB are used to multiple the outlet lines. We can realize different version of VMB according to the POU quantity and chemical type. General control communicate with CDS and controls the VMB valves.



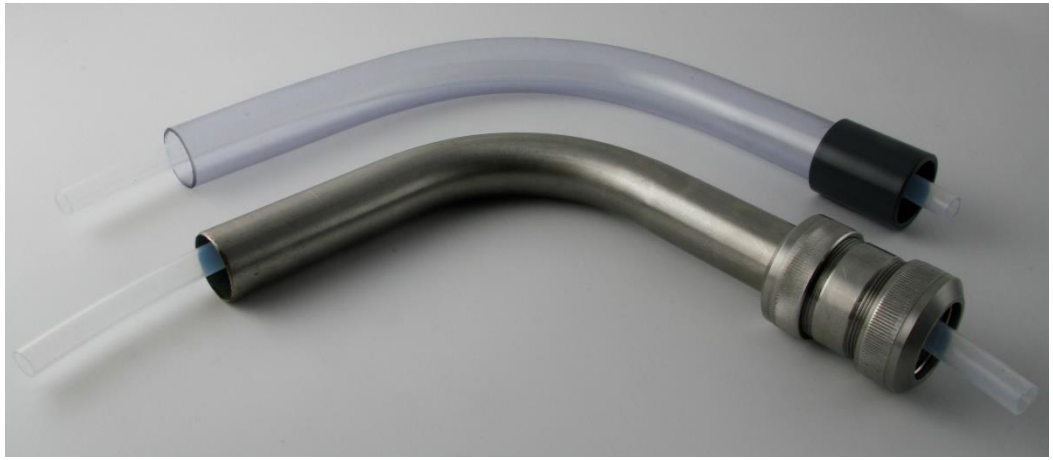
Derivation Boxes

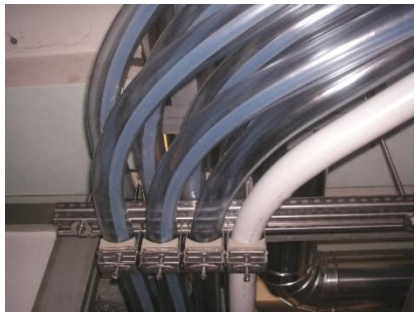


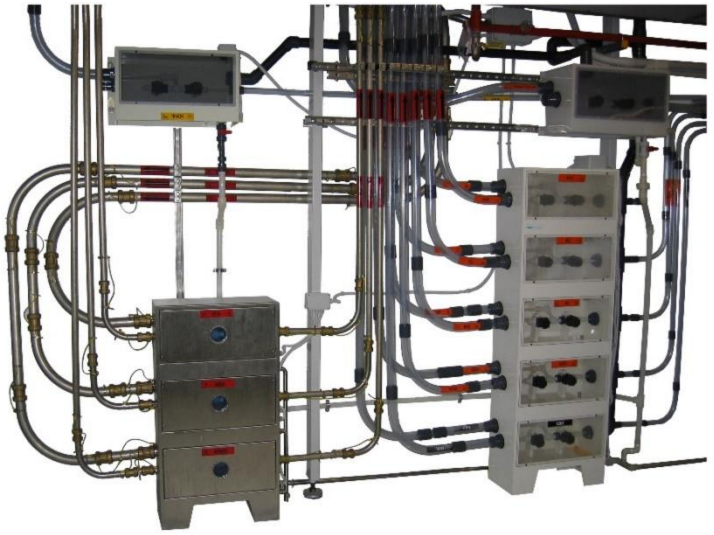


Derivation box are used to swap one line in two lines. We can realize several version of derivation boxes according to space, chemical and disposition.

Double Piping Lines







We can pratice the installation of double piping lines providing internal pipes in PFA material or SS316. External protection in transparent PVC or SS304. We can provide safety labels too indicating direction of flow.

Trolleys

Trolleys

We can realize custom trolley according to chemical media and CDS/ fab requirements.

S.P.M. s.r.l.

Ambrogio Sala

President

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