DELUGE SYSTEM TECNO-PNEUMATIC

- **For flammable liquids storage on racks**

- **In conformity with 1432 French standard**

- **New conception :** without electronic detection and without bladder of bladder tanks

- **Technology simple and proved without need of particular competences for operation and maintenance**

K - FIRE SYSTEMS

DELUGE SYSTEM

Applications :

-these types of installations are designed for protection of special risks.
when important fires expanding rapidly may be feared.

- petroleum loading installations

-particular fires of chemical products storage on Racks or flammable liquids storages

-high risks from chemical products spraying installations.

Definition :

A starting fire detection may open immediately all the the sprayers of the spraying system Installed above the zone to be protected without human intervention.

The necessary flowrate of the deluge system is reaching from 0, the maximum flow in few seconds to spray above the considered zone ;big quantities of water are necessary.

The water reserves may be used during the whole operation as indicated in the referred standards.

DELUGE system TECNO-PNEUMATIC

The complete system is made of :

1. - installed in a safe container are:
   -the vacuum generator system type **EDA**
   -the foam concentrate tank with its Concentration Pressure Controlled type **CPC**
2. the piping network with the nozzle system type Senso-spray with:
   -the thermal detectors type **TAA**
   -the high expansion foam generators type **HE**

Operation:

when the temperature is reaching 65°C the Senso-spray system releases to the atmospheric pressure the piping maintained under negative pressure by the EDA system.

When the operation is launched , immediately:

- The "barriers" are falling down in order to create the retention basin.
- This basin will receive the foam for the extinction of the fire of the dangerous products stored on the racks above the considered zone.
- Simultaneously the deluge valve of the EDA is opening : the foam solution controlled by the proportioning equipment of the CPC feeds all the high expansion generators HE or the other Senso-spray nozzles.

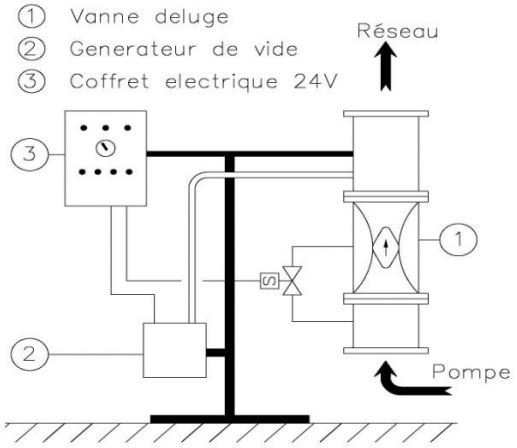
Securi-tainer data:

- Roof and walls are insulated sandwich steel sheets, structure is galvanised and plastified steel .
  -These sandwich sheets are classified according to EN 13501-1 "flame retardant "
  -Standard Colour is RAL 9002 grey
  -Standard door is 1200*2100mm with safety locker and external handle

Vacuum Generator system type EDA

Thanks to an air compressed network (or mobile compressor) the EDA system generates and maintains vacuum in the piping network down the deluge valve (1).

When the network reaches the atmospheric pressure ,(because the thermal detector TAA opens),
Then the deluge valve opens . the liquid flow is released to each nozzle Senso-spray in the piping network with its own jet deflector.



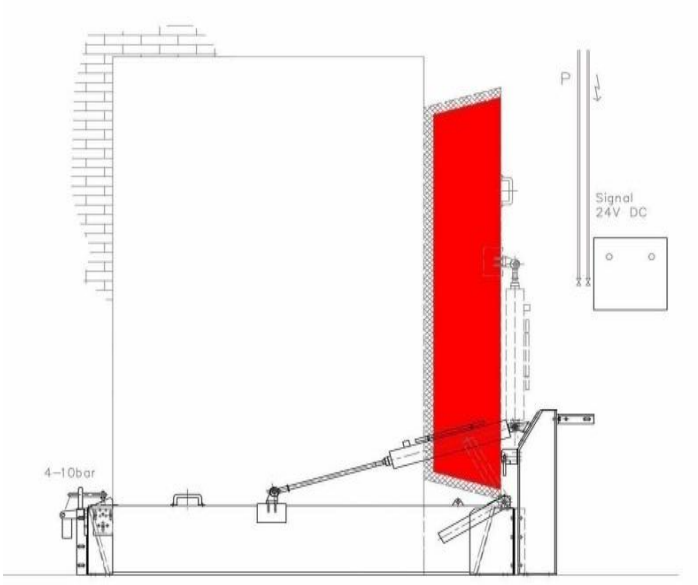
SYSTEME EDA

- **Pneumatic operation advantages:**

The maintained depression in the piping :

-accelerates the water flow to reach the Senso-spray nozzles sooner .
-suppress all corrosion effects in the pipes created by air compressed or liquid.
-stops the the plugging due to the mud
-eliminates all microbs risks (“legionnaire disease ”)
-allows the operation even with low temperatures without eco toxic additives (glycol)
-lower the mechanical stress of the structures
-each Senso spray may react as a fire detector.
-this mechanical detection eliminates the common electronic detection costs and efficiency .
-the system may be used in special spaces where ATEX equipment may be required.
-maintenance is reduced and easy for the final user ;costs are reduced (some weekly tests and Reconditionning are easy and quick, made for a better safety of the installations)
-the system is polyvalent (water and foam),versatile as the EDA is a modular system and allows the existing systems to be retrofitted.

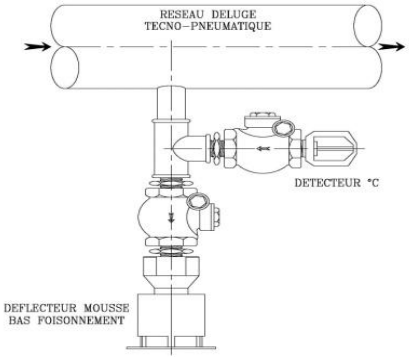
Pneumatic Barriers



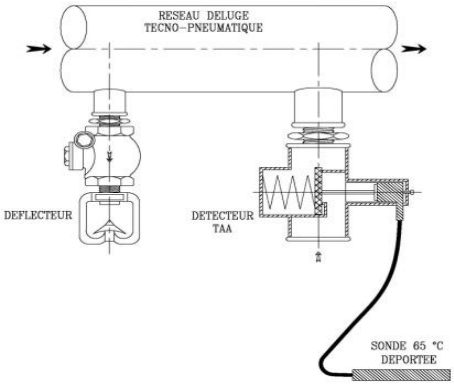
When the deluge valve of EDA opens , the barriers are unlocked to get down quickly to the ground controlled by the pneumatic cylinder. One audible alarm may inform the operators.
The length of each barrier is adapted to the rack distance .
they are maintained pressurized slightly to the ground in order to maintain a good sealing effect.

Choice of the sprayers of the Senso –spray nozzles

SENSO-SPRAY



-As a contrary of a sprinkler where the bulb is acting as a detector and as a spray (as it stops the water) the Senso-spray has the 2 simutaneous functions :temperature detector and sprayer:
-The sprayer action is provoqued when the atmospheric pressure reaches in the piping network as normally it is maintained under depression by EDA .



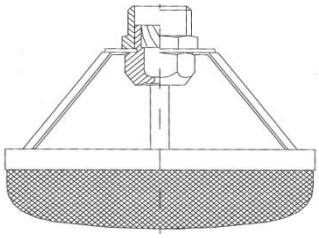
-The thermal detection is realized by opening the self-activated valve with its detector and capillary TAA. (Or by the bulbes) .
-The TAA valve are equipped with a manual ,mechanical auto testing which allows the periodical tests without causing damages .
- The spraying is realized by the water (or fluid)opening to the calibrated nozzle:
Flat ,conical or hemispheric Water jet or foam jet,
Low or middle or high expansion generator HE

conical Water jet

Flat Water jet

hemispheric Water jet or foam jet

high expansion generator HE



middle expansion

Low expansion

In the Senso-spray, the 2 functions (detection and spraying) are physically separated but each one separately or simultaneously can be activated. This typical characteristic of the Senso-spray gives a possible reaction similar to the sprinkler either similar to the deluge system : one single head detecting the temperature launches the spraying of the whole existing Senso-spray of the network.

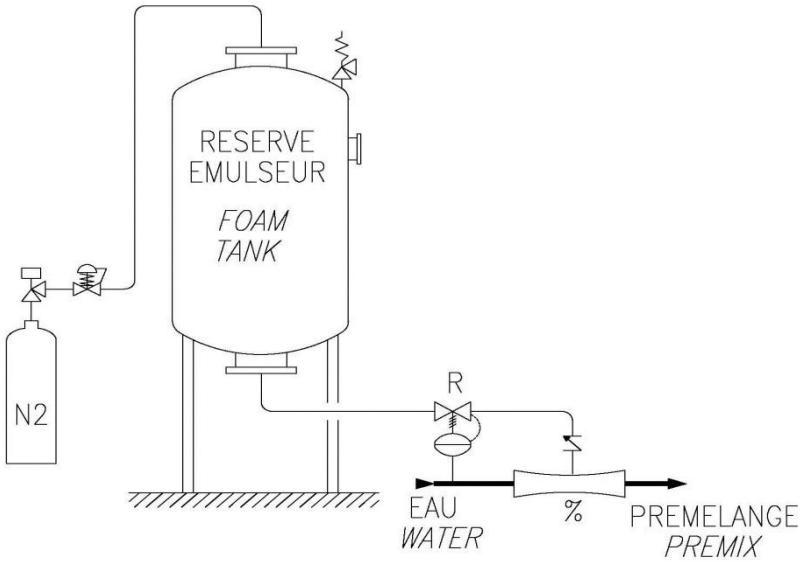
So the Senso -spray system is **polyvalent** and uses the traditional existing calibrated heads.

The Tecno-Pneumatic system with its Senso-spray **nozzles replaces the electronic detection**

With its heavy costs and low reliability.

CPC foam tank with Concentration Pressure Controled

The valve of the nitrogen cylinder is started by the opening of the deluge valve. Then it releases the nitrogen pressure into the CPC foam tank in order to obtain a constant foam solution ratio on a large scale of flows in the proportioning device.



The proportioning equipment does not include the very sensible membrane existing in the bladder tanks! Consequently :

-The possible use of a damaged membrane ,making uncertain fire fighting result, does not exist anymore. a simple visual inspection on the pressure gauge secures the operation.

-The foam level gauge is now legible as the tank is not under pressure when not in operation

-Refilling an atmospheric pressure tank is easy for any operator even not specialized

-The operation cost is far less lower.

-Nitrogen may be replaced by air compressed or CO^2

-This process may be used with any of selected foam density or viscosity

-Pressure losses are compensated automatically

- In case of one single sprinkler flow the concentration is maximum >= expected concentration.

The installation is in conformity with the NF 1432 standard

Art 7-6
automatic detection with audible alarm is required

Art 8-1
metallic products may be supplied with earthing plugs

Art 10-1
each zone should be divided in surfaces less than 500M² ,to each zone may be Associated a retention basin. Manually or automatically operated by the Fire detection.

Art 25
the final user may plan a scenario adapted to flammable liquids. foam may be processed as indicated in the standards (for polar solvent smooth application is required :with high expansion generators)

Art 27-2
application ratios may be adapted according to the fire types and Standard and According to the performance of the foam product tested with EN 1568-4

Art 27-1
The end user may install the pumps and water and foam tanks capacities out of the zones where thermal effects may reach an intensity > 5kw/m^2

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