



DELUGE SKID WITH BYPASS LINE & VDD DELUGE SKID COMPARISON



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HOW DOES A DELUGE SKID WITH BYPASS LINE COMPARE AGAINST A VDD DELUGE SKID?

The oil and power industry have seen the devastating effects of major accidents over the years and as such have made a commitment to improving safety criteria. By definition, "Safety" is the absence of an unacceptable risk of physical injury to people or damage to property. Going a level deeper is "Functional Safety" which, is part of the overall safety **but focuses more specifically on a system or equipment operating correctly in response to its input.**

The tasks of F&G systems is to detect any hazardous fire or gas condition, to alert the personnel in the area and to activate the control and mitigation systems. The "effectiveness" of the F&G system is related to the "safety availability" of all its components (Detectors, Logic Solvers and **Final Elements**). In order to increase the safety of the system each element of the chain of components **needs to perform on demand.**

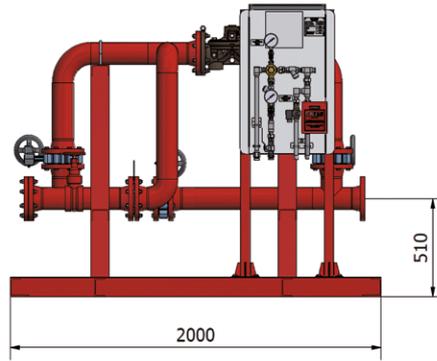
There are a number of things that can go wrong in a standard deluge system and such is recognised by designers with the implementation of manual by-pass lines or by introducing redundancies in the actuation pilot e.g. the solenoid valves. But what happens when there is a fault in the deluge system? Which system is taking over to mitigate the effect of the fire or gas cloud being released?

The SA Fire Protection Double Chamber Deluge Valve Model VDD, was designed to increase safety, reliability and response time for fire protection systems according to NFPA 15, UL 260 and IEC 61508.

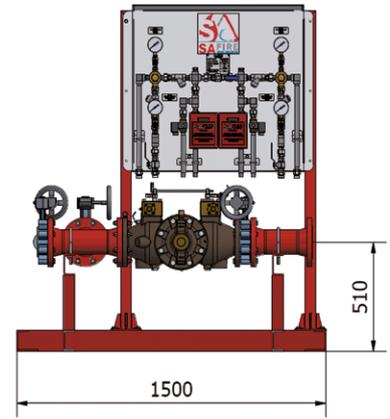
If there is a safer way of doing things that keeps people away from danger shouldn't it be adopted? The VDD satisfies the desired outcome of End Users that are seeking to improve safety levels and reduce exposure of personal to the risks associated with the hazardous area while mitigating against gas leaks/ fire outbreaks in as quick a time as possible.

SCENARIO

DELUGE SKID WITH BYPASS LINE



VDD DELUGE SKID



Can the system be operated automatically if there is a fault?

NO
Because an operator is required to operate the bypass line manually by going to the deluge skid.

YES
Because the bypassline is built in to the valve.

Does this skid ensure quick response time?

NO
Operators would need to locate the skid to open the bypass, meanwhile fire/ gas leakage is getting worse.

YES
The valve has 2 actuation trims and 2 chambers in hot back up operating simultaneously at all times; therefore the response time to failure is zero.

Will the system operate if there is a fault with deluge valve, solenoid valve or control trim?

NO

YES
VDD can support up to 2 failures taking place at the same time: 1 failure on the trim and 1 failure in the chamber.

Does the deluge system remain operational when servicing (NFPA 25), the deluge valve or its trim?

NO
The system becomes impaired once any components of the trim or the valve is removed.

YES
Service maintenance or repairs can be carried out on one chamber at a time while the other chamber remains fully operational, the same applies for the control trim.

Is the fire system capable of operating normally and automatically while waiting for spare parts?

NO
Once a critical component is damaged the system becomes impaired.

YES
The complete redundancy of the VDD valve and trim will keep the system operational automatically even in degraded mode and as a result the process area will be protected until the spare part arrives.

In Offshore applications, are the skid dimensions an efficient use of space?

NO
Extensive piping and additional valves add to dimensions and weight.

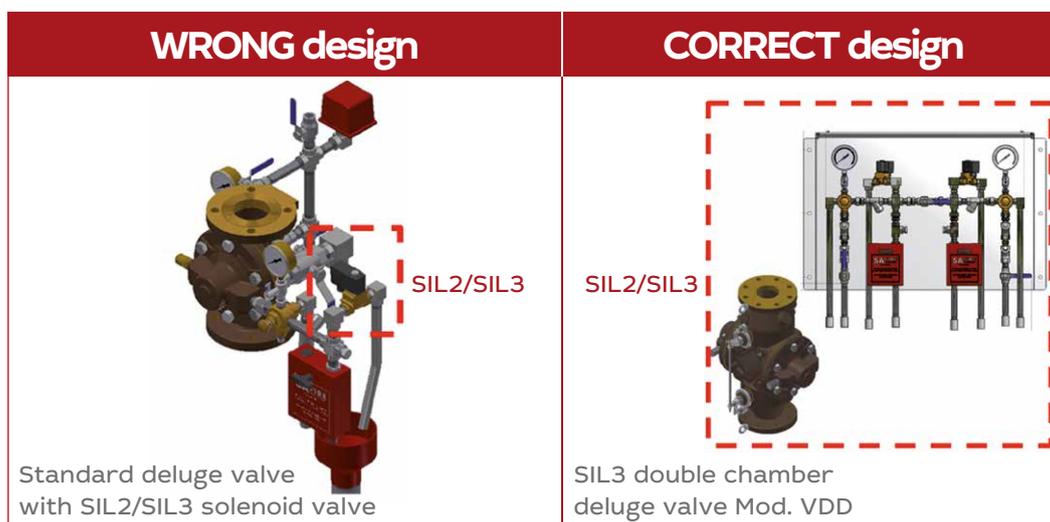
YES
The skid is streamlined, occupies a smaller area and typically weighs less.

Is the skid cost effective?

NO
Additional piping and valves increase costs.

YES
Less material, less weight, less cost.

SCENARIO	DELUGE SKID WITH BYPASS LINE	VDD DELUGE SKID
In case of failure of the deluge valve is it possible to keep personnel away from the Danger Zone?	<p>NO</p> <p>Because in order to operate the manual bypass line operators are forced to expose themselves to additional risk.</p>	<p>YES</p> <p>Because operators are kept away from the risk while the VDD ensures mitigation where needed thanks to its built in bypass line.</p>
Is this system reliable?	<p>NOT ALWAYS</p> <p>One dangerous fault and the system will not respond.</p>	<p>YES</p> <p>The VDD has a fully redundant architecture to achieve a high level of reliability to the point that its is even capable to overcome a double failure.</p>
Can this system deliver continuous protection?	<p>NO</p>	<p>YES</p> <p>The VDD can be partially isolated to allow maintenance or repairs. The remaining portion of the deluge system will grant continuous protection in any circumstances.</p>
Should the protected process area remain operational if the deluge skid has a fault?	<p>NO</p> <p>But often the process remains operational with the system in manual mode and limited fire safety with use of a local fire brigade.</p>	<p>YES</p> <p>The VDD valve allows continual fire protection so there is no need reduce operations or to alert fire brigades/ external authorities.</p>
Does the Safety Integrity Level cover the entire architecture?	<p>NO</p>	<p>YES</p> <p>SIL 3 capable for the whole configuration certified by Bureau Veritas ensuring the highest possible level of reliability. The VDD is designed in line with O70 Norwegian Oil & Gas Application of IEC 61508 and 6151 in the Norwegian petroleum industry *(NORSK Oije & Gass).</p>



Take a closer look at the VDD

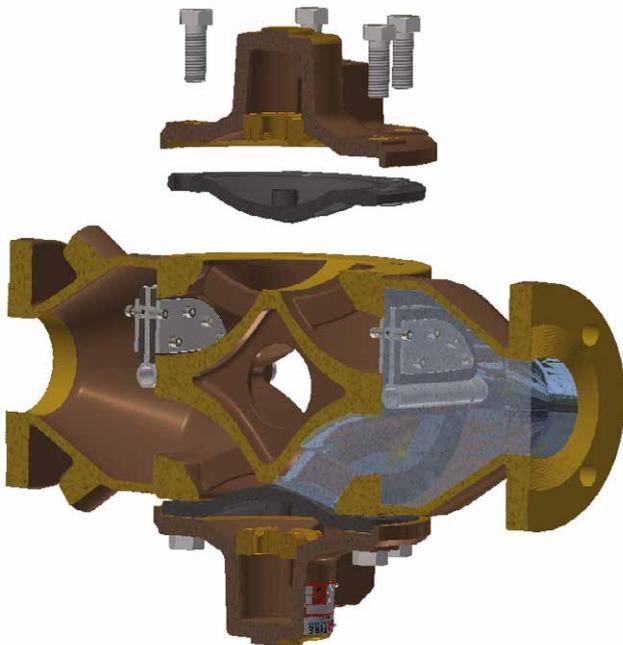
With the VDD it is possible to isolate any one chamber at a time or to have both chambers in operation simultaneously.

In normal operating conditions the water is supplied to the priming chambers through the trims. The pressure of the water trapped in the priming chambers holds the diaphragms on the valve seats, keeping the valve closed.

During maintenance the two priming chambers can be alternatively isolated and inspected turning the in-built isolation valves, keeping the fire protection system in service through the other chamber.

In fire conditions the pressure is released from the control chambers by the automatic or manual release device of the trims. The water supply pressure in the inlet chamber forces the diaphragms off the seats, allowing water to flow in to the system and the alarm devices.

ONE CHAMBER OPERATIONAL, ONE CHAMBER UNDER INSPECTION NFPA 25

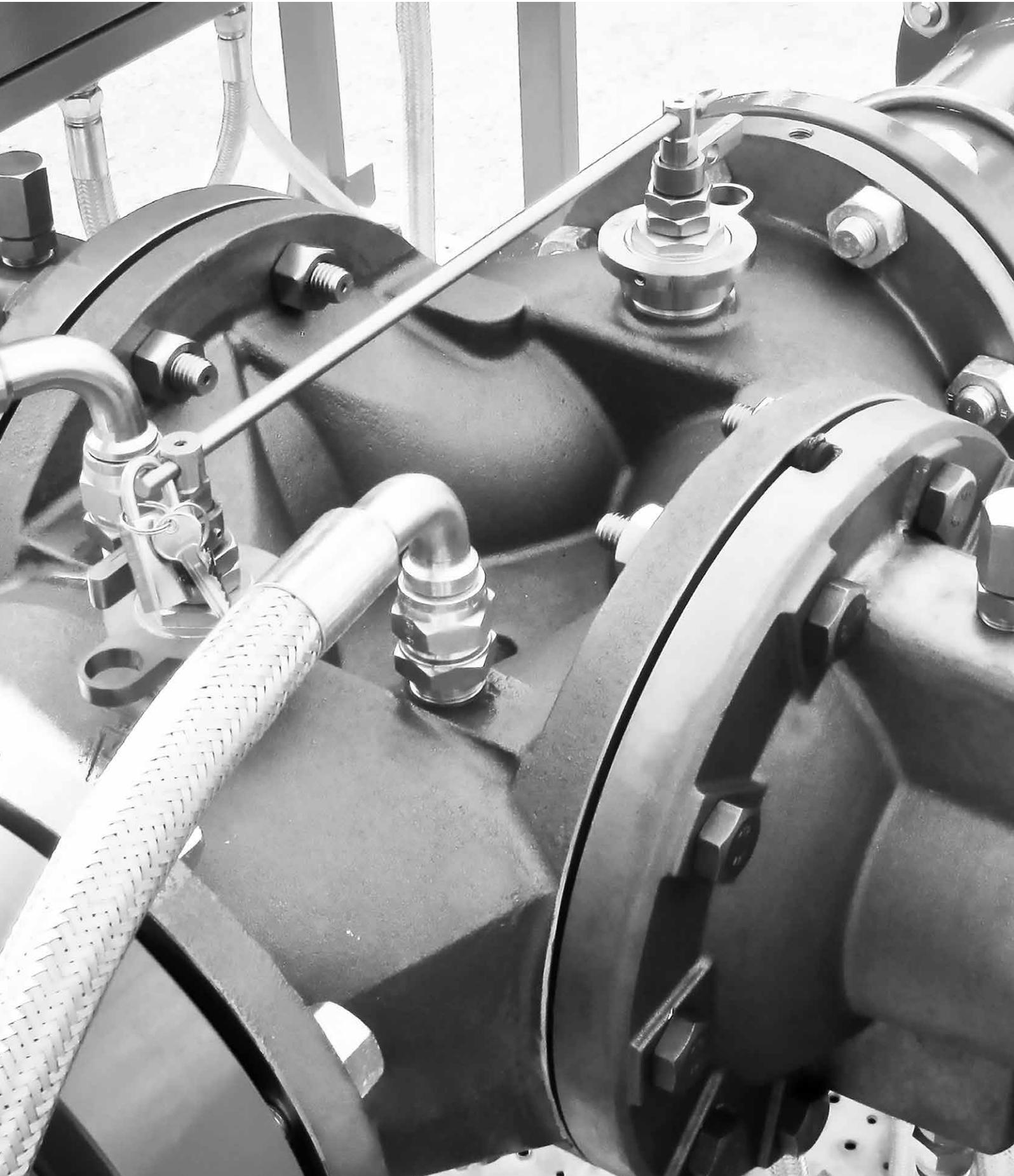


BOTH CHAMBERS OPERATIONAL



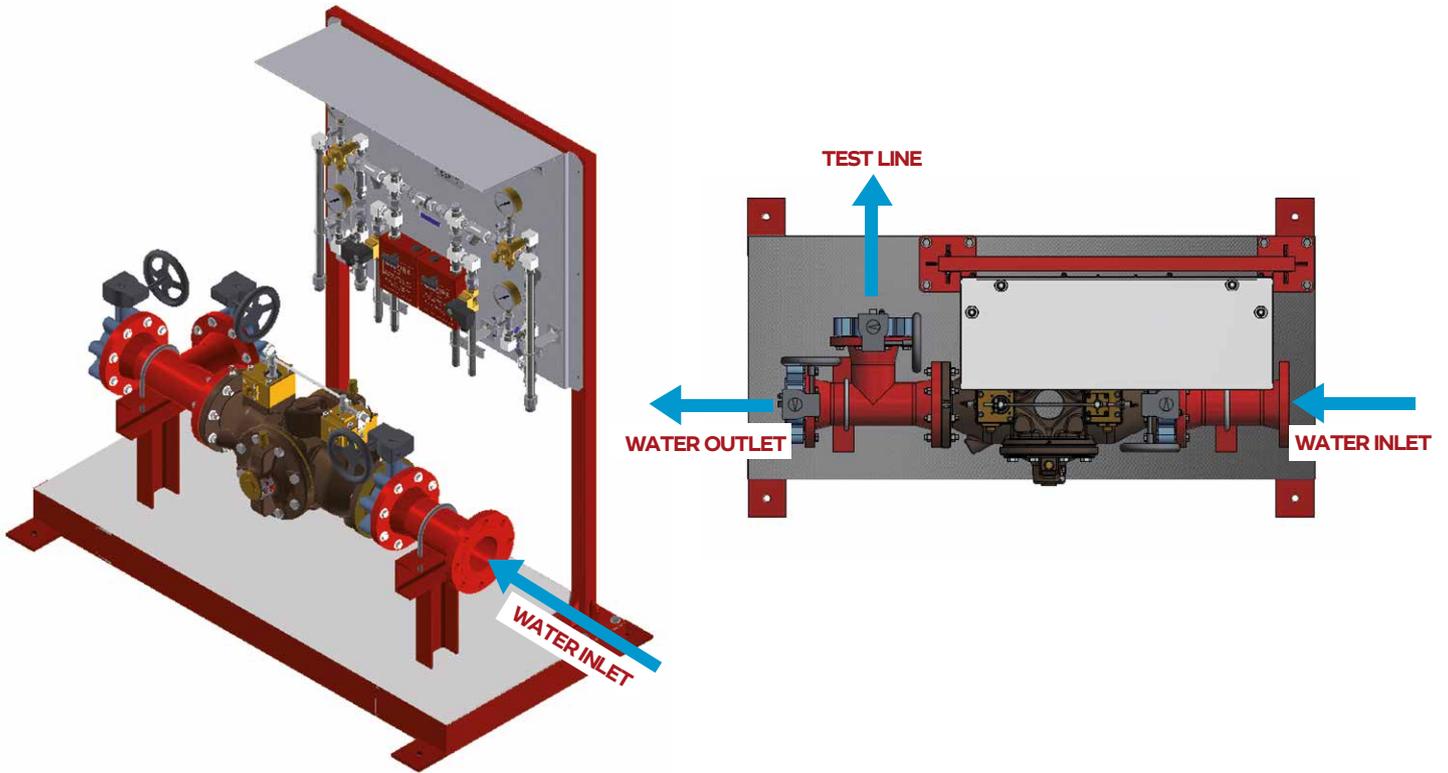
VDD DELUGE SKID

**SAVE MONEY | SAVE WEIGHT | INCREASE RELIABILITY
INCREASE AVAILABILITY | INCREASE SAFETY**



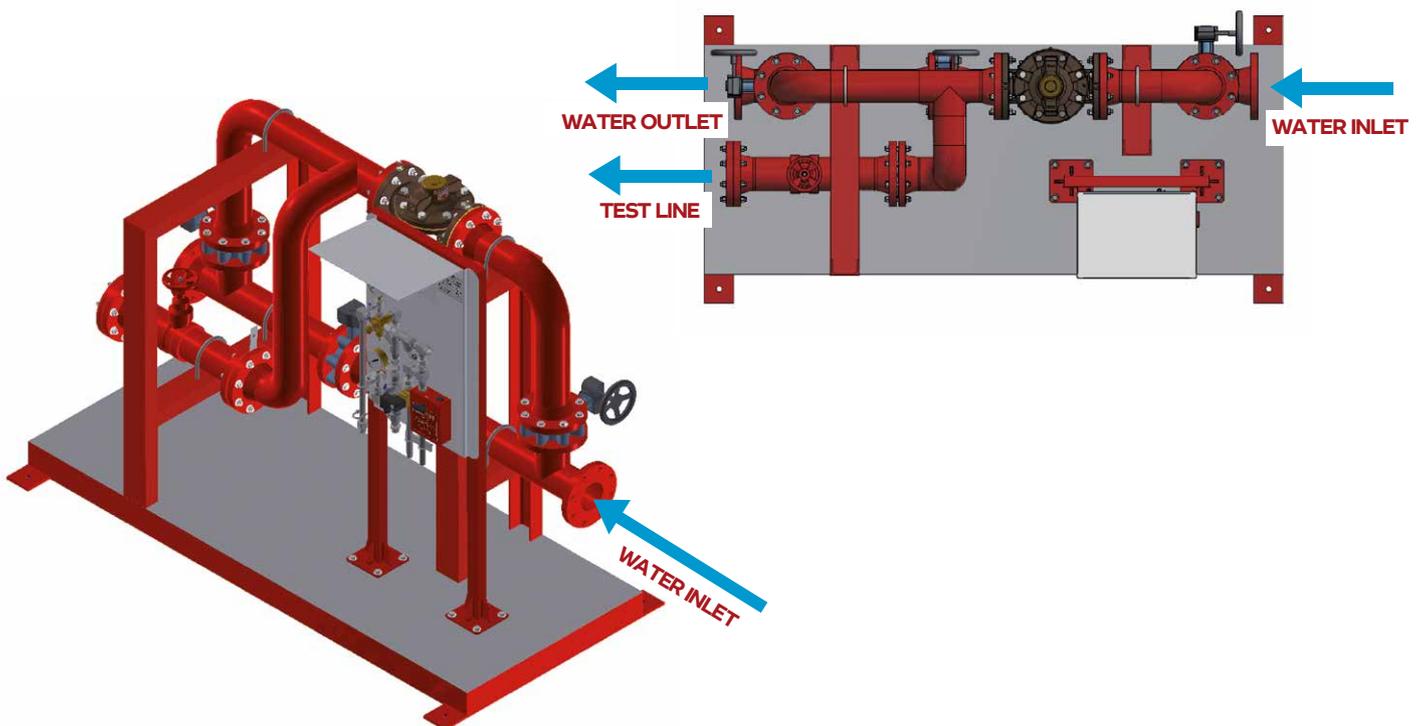
VDD DELUGE SKID

A



DELUGE SKID WITH BYPASS LINE

B





SA FIRE
PROTECTION

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