

MAXON PSCHECK™

Partial Stroke Technology with Series 8000 Pneumatic Safety Shut-off Valve

Honeywell



**Safety First.
Efficiency First.
Success First.**

Process control depends on its sub-systems to help keep the operation running safely, seamlessly and without downtime.

In combustion safety systems, the safety shut-off valve (SSOV) is one of the most critical elements of a complete Safety Instrumented System (SIS). Safety regulations, including Safety Integrity Level (SIL) guidelines call for yearly testing of SSOVs, while a National Fire Protection Association specification mandates that SSOVs use partial stroke diagnostics to meet International Electrotechnical Commission (IEC) 61508/61511 standards for safe process operation.



Definitions and Explanations of Safety Standards

- **SIL** – Safety Integrity Level is a discrete level for specifying the probability of a safety instrumented system satisfactorily performing the required safety instrumented functions under all of the stated conditions within a stated period of time. SIL is required for Safety Instrumented Systems (SIS).
- **SIS** – Safety Instrumented Systems are designed to protect personnel, equipment, and the environment by reducing the likelihood or severity of an identified emergency event.

Partial Stroke Technology Helps Keep Operations Running

Maxon's Series 8000 pneumatic SSOV, combined with MAXON PSCHECK™ technology, can offer a SIL 3-capable system. MAXON PSCHECK systems utilize partial stroke technology that determines the status of an SSOV without shutting down or interrupting combustion operations – regardless of how many times valves are tested – to enable uninterrupted process flow.

Data from tests is collected and trended to detect valve degradation, giving process control plants better predictive maintenance and reducing the possibility of undetected valve failures. Frequent testing of the Series 8000 pneumatic safety shut-off valve also helps clean the surfaces of the metal-to-metal valve seats, which are enhanced by the wear in, not out design feature.



Don't Operate Unaware.
MAXON PSCHECK systems offer diagnostics that can identify a potential critical valve failure prior to it causing a catastrophic event.

- **SIF** – Safety Instrumented Function is a set of sensors, logic solvers, and actuators designed to carry out one or more safety instrumented functions.

- **PFD** – Probability of Failure on Demand, in general terms, means the likelihood that a valve will fail on demand when required to close.



How The Technology Is Different

Achieving SIL 3

MAXON PSCHECK™ technology and the Series 8000 pneumatic safety shut-off valve are both SIL 2 certified; when combined, SIL 3 certification and SIF is possible. No additional system add-ons or non-conforming hardware are required. This can substantially reduce the cost to purchase and operate the system, and the certification process is streamlined while minimizing ongoing maintenance.



Works with Existing 8000 Valves

If you already have the Series 8000 pneumatic SSOVs, there's no need to purchase new valves.

System Simplicity

Programming and testing is user friendly, simple to execute and easy to understand. It is not necessary to be an expert in SSOV valves, digital shutdown devices, or SIL rating compliance to complete the test and interpret the results.



MAXON PSCHECK™ technology and the Series 8000 pneumatic SSOV offer superior safety and reliability. The combined system helps offer uninterrupted process flow and insight into predictive maintenance issues.

Compact Footprint

The Series 8000 pneumatic safety shut-off valve features an integral solenoid, quick exhaust and position switches, and powerful closing spring to provide valve closure in less than one second. The valve's compact footprint minimizes space requirements and simplifies piping design.

Valves that Wear In, Not Out

The Series 8000 pneumatic SSOV's performance is actually improved with frequent tests. Due to the rising stem metal-on-metal seating aspect of the valve shut-off technology, the more often the valve is tested the better the long-term performance. The frequent stroking of the valve causes the metal-to-metal seats to wear in and not out; unlike soft-seated valves that wear with frequent use.



The wiping action of the rising stem and the disc seat cleans the valve and helps prevent sludge and contaminant build-up.

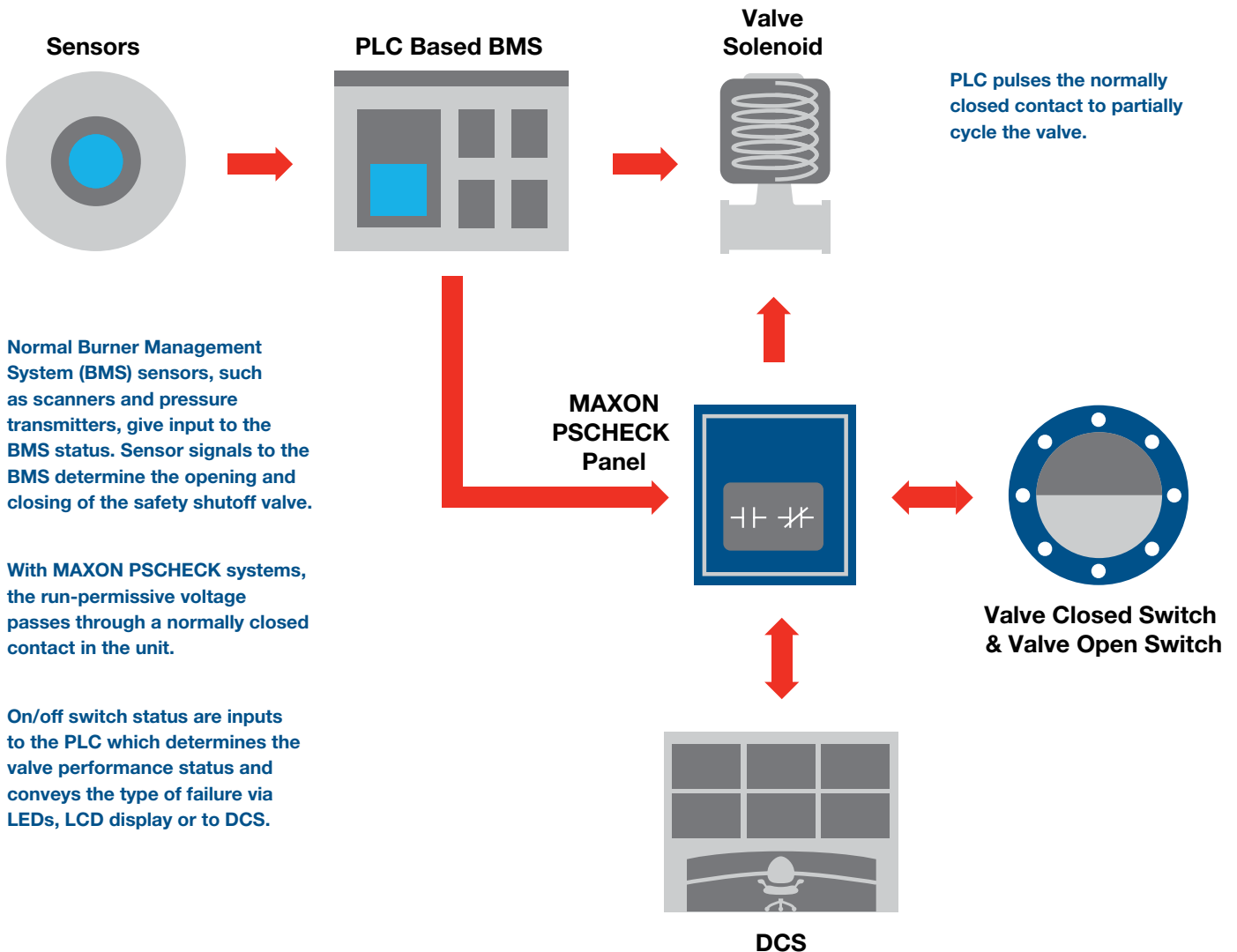


How The Technology Works

Intuitive and Flexible

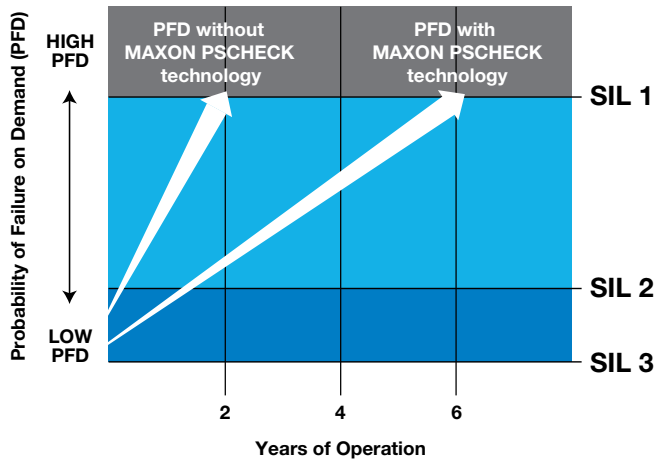
Tests performed by MAXON PSCHECK™ systems are customized to meet SIL performance level criteria; tests can run daily, monthly, bi-monthly, quarterly, annually, bi-annually, or at a customer set test cycle rate. The system can also run a manual valve test for instances when immediate feedback is required.

The test identifies a potential early failure or signals a hard failure on the Series 8000 pneumatic SSOV by checking the amount of time required for the valve to “trip,” signaling a capability to either open or close. MAXON PSCHECK technology will test a valve’s potential to close (PASS/FAIL) and will check for degradation over time (trending) as part of its diagnostics. The technology and unique process for partial stroke testing of the Series 8000 pneumatic SSOV is fully patented and protected.



The MAXON PSCHECK technology is an IEC 61511 SIL2 certified diagnostic system that along with Maxon’s Series 8000 valves helps meet SIL3 compliant Safety Instrumented System (SIS) performance requirements.

Performance diagnostics capture information about the valve's performance and track the overall health of the Series 8000 pneumatic SSOV. This information is then plotted to show the lifetime health of the valve. The trending information shows a linear relationship between the degradation of the valve's performance over its life, thus indicating when the valve may fail.



Increased length between valve maintenance while maintaining SIL 2.

All valve test results can be easily viewed and exported for analysis, audits and presentation to regulatory or insurance authorities.

Depending on the system specifications, local or remote annunciation of valve health reporting can be viewed locally at the panel, via an auxiliary triggered alarm or light, or directly via a DCS direct link.



Industry Applications

- Agriculture/Food Processing
- Bio-fuel Operations
- Burner and Boiler Manufacturers
- Coke Ovens
- Metals and Mining
- Petro-chemical Refineries



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