

The Market Leading Partial Stroke Testing Solution

Rotork Fluid Systems' patented, Smart Valve Monitor (SVM) is the most versatile and effective partial stroke valve testing system for hydraulically or pneumatically actuated on/off valves available. It tests every component of the valve/actuator/control final elements ensuring the highest possible SIL performance for the valve design.

SVM has several unique features that set it apart from the features offered by many competing products. SVM also provides detailed diagnostic data allowing the operator to plan strategic preventive maintenance and extended compulsory shutdown intervals.

Simple, Non-intrusive Solution

SVM is unique among partial stroke testing techniques in that it does not become part of the control system for the valve. Consequently, it is impossible for the SVM to prevent the valve from closing on demand. In addition, this allows the user to design the control system for the valve to exactly suit the safety and operational requirements without having to compromise for the testing system.

To facilitate this, a control unit is connected to the power supply to the solenoid valve. The monitoring function is then provided by a pressure transmitter located at the actuator to monitor the instrument pressure changes while the valve moves. Any changes in valve performance will be detected by a change in the pressure wave exiting the actuator. This is shown in figure 1.

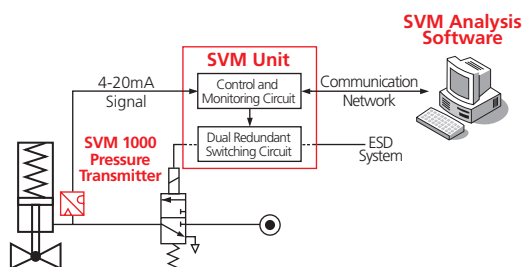
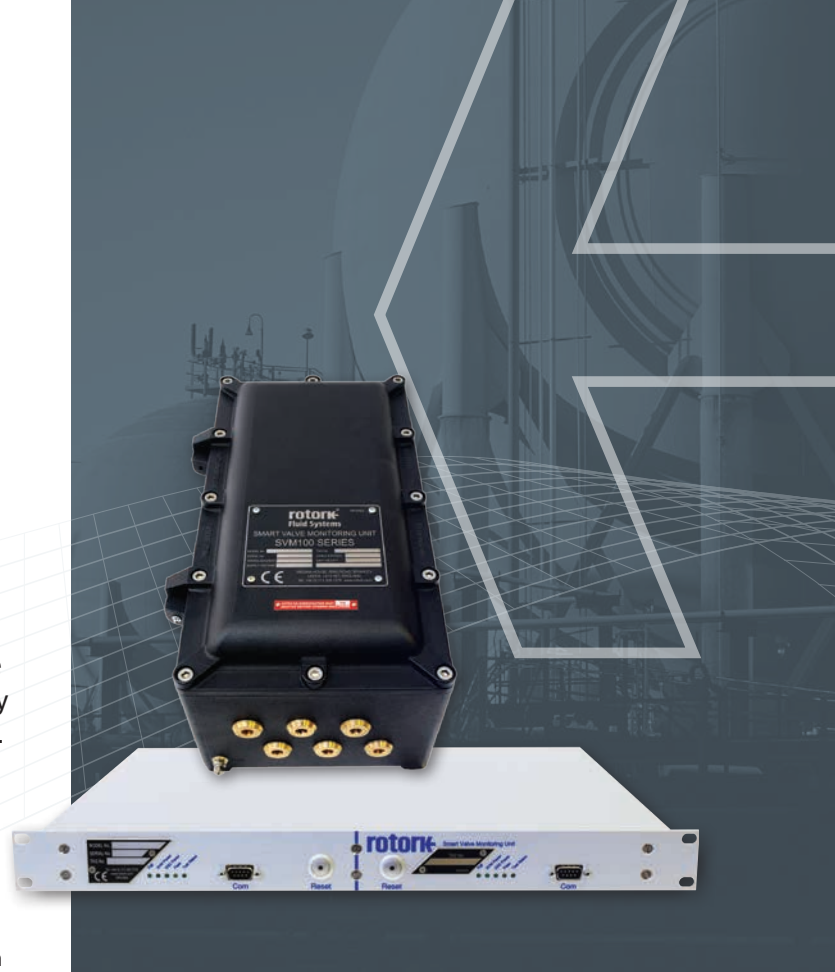


Fig. 1. Basic SVM Configuration

Due to its simple yet complete design, the SVM can be used with a complex control mechanism without the need for any additional equipment. An example is shown in figure 2 opposite, a HIPPS valve with dual redundant solenoid valves and three quick exhaust valves.

Redefining Flow Control



SVM Range Partial Stroke Test System

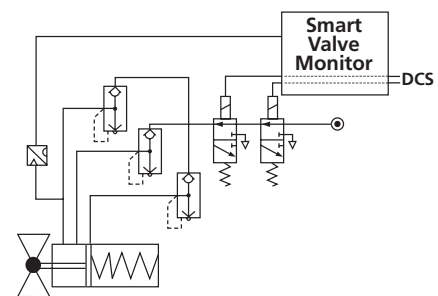


Fig. 2. HIPPS Configuration

Rotork SVM offer significant benefits

- Simple, non-intrusive solution.
- Provides the best possible test.
- Compatible with all valve actuator types.
- Provides the best possible SIL performance.
- Provides key maintenance diagnostic data.

Provides the best possible test

The SVM system is designed such that the partial stroke is controlled by switching the signal from the ESD system to the solenoid valve thus simulating a shutdown. This means the SVM system will always test every final element component of the shutdown system – no matter how complex the control system.

Therefore, the SVM system is capable of detecting all failure modes of the valve, actuator and controls that are possible during a partial stroke test. These failure modes include – but are not limited to – the following examples:

Actuators

- ✓ Spring failure
- ✓ Internal corrosion
- ✓ Damaged cylinder
- ✓ Worn scotch yoke

Valves

- ✓ Stuck valve
- ✓ Stem shear
- ✓ Excessive torque
- ✓ Tight packing

Valve Controls

- ✓ Exhaust blockage
- ✓ Sticking SOV
- ✓ QEVs
- ✓ Pilot valves

Compatible with all valve and actuator types

The SVM system is an extremely versatile partial stroke testing system compatible with both quarter-turn and linear valves in virtually any fluid power actuator control configuration. This includes – but is not limited to – the following:

Actuators

- ✓ Pneumatic
- ✓ Hydraulic
- ✓ Electro-hydraulic
- ✓ Spring-return
- ✓ Double-acting
- ✓ Linear
- ✓ Quarter-turn
- ✓ Rotary vane

Valves

- ✓ Ball
- ✓ Butterfly
- ✓ Gate
- ✓ Globe

Valve Controls

- ✓ Single or twin solenoids
- ✓ Quick exhaust valves
- ✓ Pilot valves
- ✓ Shuttle valves

This high degree of flexibility means that the SVM system is suitable for use with ESDVs, HIPPS, ROSOVs & SSIVs.

Provides key maintenance diagnostic data

Historically engineers are only able to diagnose the performance of their valves during a shutdown. This has one major drawback; the majority of possible spares needed to maintain a plant will not be readily available. This is compounded by the fact that many replacement regimes stipulate that an item is only replaced when it fails.

The SVM system provides comprehensive diagnostic data for all components of the valve. Through periodic testing, the maintenance team is able to build a history of invaluable performance data. This allows engineers to plan maintenance and order spare parts in advance of shutdown activities.

Provides the best possible SIL performance

When it comes to assessing SIL for a shutdown system, performance is everything. The better the quality of the testing, the safer the system and therefore the plant's operations are safer. Many testing systems, particularly positioners, add to the number of ways in which the safety valve can fail and also, in some circumstances, can prevent the valve from actually closing. In addition to contributing to the failure rate, these systems do not always test all of the components of the system thus providing an incomplete test.

The SVM system is 100% failsafe and cannot, in any manner, contribute to the failure rate of the safety function and can never prevent the valve from closing on demand. SVM always tests every part of the final elements of the safety valve. The nature of the SVM system ensures that the best possible test is always conducted by ensuring that all of the components are always tested.

This all means that operators can be sure that they are getting the maximum safety performance from their systems while running their plants at maximum production efficiency.

For a detailed explanation of the SVM system, see publication PUB026-002.

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