

# SUCO extends the overpressure protection and redefines the burst pressure of its mechanical pressure switches

SUCO pressure switches "Made in Germany" are represented in nearly every industrial sector, in which hydraulic or pneumatic pressure must be reliably and safely measured, monitored and controlled. For decades, mechanical pressure switches from SUCO have acquired an excellent reputation worldwide. Its customers include well-known manufacturers in the fields of mobile hydraulics, machine and plant construction, as well as medical and process technology.

In addition to the wide range of variants and the defined temperature resistance covering extreme conditions (NBR down to -40°C, FFKM up to +120°C), the extraordinary features of SUCO's mechanical pressure switches also include long service life and outstanding overpressure safety.

By continuously optimizing its processes and components, SUCO has succeeded in significantly increasing the already above-average overpressure resistance of its mechanical pressure switches. This was confirmed, among other things, by an external, independent test laboratory as part of a dynamic pressure change test. Before the test results are presented, a number of general terms should be defined.

## **Pressure change rate, static and dynamic pressure**

In general, a distinction is made between static and dynamic pressure within a hydraulic or pneumatic system. The static pressure describes the pressure that a static liquid or gas exerts on an object (e.g. diaphragm of the pressure switch). If the pressure changes over time, this is referred to as dynamic pressure.

The pressure change rate (pressure rise / fall) indicates the pressure change over time for the rising or falling pressure. The pressure change rate is indicated in bar/s or bar/ms. SUCO considers pressure change rates less than 100 bar/s to be static pressure.

## **Overpressure (safety)**

Each pressure switch is designed for a specific pressure range depending on the type of construction and material design. If pressures above this defined pressure range occur during operation or in the system, this is referred to as overpressure. In order to be able to select the best possible pressure switch for the respective application, SUCO has defined the overpressure safety for its pressure switches, in which the pressure switch retains its functionality and tightness.

## **Burst pressure**

All pressure switches have physical limits regarding the applied pressure load. If the pressure load is too high, the pressure switch can be damaged or destroyed. The burst pressure defines this limit. Exceeding this limit represents a considerable safety risk for man, machine and environment.

In general, the specified data for overpressure safety and burst pressure are static values. According to the "state of the art", the permissible dynamic pressure must be 30 - 50 % below the static pressure.

## **Results of the dynamic pressure cycling test**

During the production process, SUCO regularly carries out product tests in its own in-house test laboratory. In addition to simulating extreme environmental conditions through temperature, vibration and corrosion tests, static and dynamic pressure load tests are carried out continuously. The static burst pressure is determined using a manual pressure test pump, while the dynamic overpressure strength is determined on an endurance test bench with pressure swing rates of up to max. 5,000 bar/s.

SUCO has commissioned an external, independent test laboratory to carry out a dynamic pressure swing test up to 720 bar at a pressure change rate of 1000 bar/s in order to provide independent verification of the pressure resistance of their mechanical pressure switches.

A selection of mechanical diaphragm and piston pressure switches has been tested. Based on the test results, the above average overpressure resistance values of all tested pressure switches can be confirmed. Some of the series completed the entire test scenario with a total of 1.5 million cycles at various pressure levels up to max. 720 bar without failure.

Following the results, SUCO will extend the values for static overpressure strength even further. In addition, SUCO will specify values for the static burst pressure for the hex 24 and hex 27 mechanical pressure switches in future, which will reach impressive values of up to 1,000 bars. The new specifications for overpressure resistance and burst pressure are shown in the following table.

Catalogue switches, hex 24						
	0110-0124 0410-0422 Diaphragm	0111-0125 0411-0423 Piston	0166/0168 Diaphragm	0163 Diaphragm	0164 Diaphragm	0169 Piston
Housing material	zinc plated Steel	zinc plated Steel	zinc plated Steel	zinc plated Steel	Stainless steel	zinc plated Steel
Pressure range [bar]	0,1-50	50-150	0,1-50	0,1-50	0,1-50	50-200
Static overpressure protection [bar]	300	600	300	600	600	600
Static burst pressure [bar]	400	700	400	700	700	700
Approved threads	<b>G1/4 - R1/4 - M12x1,5 - M14x1,5 - NPT1/4 - 9/16-18 UNF</b>					
Thread sealing:	<b>- For cylindrical threads, use bonded seals and sealing rings designed for the compressive load</b> <b>- Tighten with suitable screw-in torque only.</b>					
Catalogue switches, hex 27						
	0132/0134/0136 0184/0194 Diaphragm	0133/0135/0137 0185/0195 Piston	0170/0180/0190 Diaphragm	0171/0181/0191 Piston	0186/0196 Diaphragm	0187/0197 Piston
Housing material	zinc plated Steel	zinc plated Steel	zinc plated Steel	zinc plated Steel	Stainless steel	Stainless steel
Pressure range [bar]	1-100	50-200	1-100	50-200	0,5-100	50-200
Static overpressure protection [bar]	400	700	400	700	400	700
Static burst pressure [bar]	700	1000	700	1000	700	1000
Approved threads	<b>G1/4 - M12x1,5 - M14x1,5 - NPT1/4 - 9/16-18 UNF</b>					
Thread sealing:	<b>- For cylindrical threads, use bonded seals and sealing rings designed for the compressive load</b> <b>- Tighten with suitable screw-in torque only.</b>					

The average burst pressure within the fluid market is approx. 20-30 % higher than the overpressure safety. With burst pressure values of up to 1.75 times the overpressure safety, SUCO is significantly higher here and can once again demonstrate its quality leadership.

### Abstract

Through continuous product development, SUCO has succeeded in further increasing overpressure safety and bursting pressure. This has a positive effect on the service life and operational safety of their products. Thanks to this improvement, the SUCO group is taking one big step towards its vision of being one of the leading solution providers in the field of pressure monitoring and drive technology. Together with more than 65 mostly exclusive sales partners, worldwide customer service is ensured.

*The SUCO group - a reliable and innovative solution provider, worldwide at your side*

## Short version

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By continuously optimizing its processes and components, SUCO has succeeded in significantly increasing the already above-average overpressure resistance of its mechanical pressure switches. This was confirmed, among other things, by an external, independent test laboratory as part of a dynamic pressure change test.

A selection of mechanical diaphragm and piston pressure switches has been tested. Based on the test results, the above average overpressure resistance values of all tested pressure switches can be confirmed. Some of the series completed the entire test scenario with a total of 1.5 million cycles at various pressure levels up to max. 720 bar without failure.

Following the results, SUCO will extend the values for static overpressure strength even further. In addition, SUCO will specify values for the static burst pressure for the hex 24 and hex 27 mechanical pressure switches in future, which will reach impressive values of up to 1,000 bars.

The average burst pressure within the fluid market is approx. 20-30 % higher than the overpressure safety. With burst pressure values of up to 1.75 times the overpressure safety, SUCO switches are significantly higher, which has a positive effect on the service life and operational safety.

Thanks to this improvement, the SUCO group is taking one big step towards its vision of being one of the leading solution providers in the field of pressure monitoring and drive technology. Together with more than 65 mostly exclusive sales partners, worldwide customer service is ensured.

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