

**Reliability Data for: Product series SY51\*0-\*\*1(-\*\*)-X74**

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**Important !**

All use of the products described in this document shall comply with the currently valid technical documentation (Catalogue, Instruction Manual (IM) or Operation Manual (OM), Handling Precautions for SMC products, e.t.c.) and is under the sole risk and responsibility of the user. SMC gives no warranty, neither express nor implied for the suitability of any component for the users intended application.

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

**B<sub>10</sub> / B<sub>10D</sub> data**

Based on the following endurance test results and assuming a failure mode following the Weibull distribution the following B<sub>10</sub> and B<sub>10D</sub> data have been estimated. (90% confidence level).

Series models	B <sub>10</sub>	B <sub>10D</sub>	Pressure MPa
SY51*0-**1(-**)-X74	59 million cycles	118 million cycles	0.7

**NOTES:**

- 1) The estimated reliability data provided is only applicable to the component in the stated operating conditions. Other operating conditions may lead to different results.
- 2) The B<sub>10D</sub> value is based on the provided B<sub>10</sub> value using B<sub>10</sub>×2 in accordance with ISO 13849.
- 3) The component is not a safety component as defined by Article2(c) of the Machinery Directive 2006/42/EC and is not supplied to directly provide a safety function.
- 4) The determination of B<sub>10</sub> is generally based on the methods described in ISO 19973  
"Pneumatic fluid power – Assessment of component reliability by testing" excluding the air pressure.

**Result of reviewing the design with respect to ISO 13849-1:2015**

SMC have tested this product in laboratory conditions to establish the life time data which can be supplied to you as an estimated B<sub>10</sub> value.

The target life was reached with no failures under those laboratory conditions.

The ISO 13849-1 standard defines a well-trying component to be one that has been:

- a) widely used in the past with successful results in similar applications, or
- b) made and verified using principles which demonstrate its suitability and reliability for safety related applications.

Regarding a) SMC is a major supplier of components to many customers and hence cannot be aware of all the specific applications that the component has been or maybe used for, so is not able to comment on this requirement.

Regarding b) SMC has reviewed the basic and well tried safety principles in accordance with the supplied information.

For these reasons the user must make his own judgement based on his knowledge and experience if it is appropriate or not to consider this product as a well-trying component for his application.

**Result of reviewing the design with respect to ISO 13849-2:2012**

This component is capable of meeting the relevant basic safety principles\*. ☐ yes

This component is capable of meeting the relevant basic and well-trying safety principles\*. ☒ yes

Please refer to the table below.

Product	ISO 13849-2 : 2012								
	Annex A			Annex B			Annex D		
	A-1	A-2	A-3   A-5	B-1	B-2	B-3   B-18	D-1	D-2	D-3   D-21
SY51*0-**1(-**)-X74	●	●	-	●	●	-	●	●	-

A-1 , B-1 , D-1 : Basic safety principles

A-2 , B-2 , D-2 : Well-trying safety principles

● : reviewed

- : not reviewed

\*Only when used as a component of a safety related part of a control system (SRP/CS) which is specified, designed, tested and maintained in accordance with the applicable safety requirements under the responsibility of a suitably qualified professional engineer.

Exceptions: the component does not meet the following relevant safety principles.

1. Valve closed by load pressure (B-2)
2. Fault avoidance in cables (conductors are not individually screened) (D-2)
3. Oriented failure mode (A-2,D-2)

Note on de-energisation principle:

Energy source status	Valve state prior to energy cut	Effect on spool position
Air pressure present, electricity cut	4(A) side energised	Spool returns to the off position by air force and spring force
Air pressure cut (main supply and external pilot) before electricity cut	4(A) side energised	Spool returns to the off position by spring force

Refer to IM No. SY7000V-SMU07 and special product drawing for details

Refer to the following how to order for validated products

MODEL NO.	
BASE MOUNTED: SY5100-**-X74	
TOP PORTED : SY5130-**-X74	
RATED VOLTAGE	THREAD TYPE
5 : 24VDC	NIL: RC
6 : 12VDC	F : G
LIGHT & SURGE SUPPRESSOR	N : NPT
NIL: W/O LIGHT & SURGE SUPPRESSOR	T : NPTF
(NON-POLAR)	A, B PORT SIZE
S : W/SURGE SUPPRESSOR	01: 1/8"
Z : W/LIGHT & SURGE SUPPRESSOR	C4: ONE-TOUCH FITTINGS
R : W/SURGE SUPPRESSOR (NON-POLAR)	FOR Ø4 TUBE
U : W/LIGHT & SURGE SUPPRESSOR	C6: ONE-TOUCH FITTINGS
(NON-POLAR)	FOR Ø6 TUBE
	C8: ONE-TOUCH FITTINGS
	FOR Ø8 TUBE