Reliability Data for: Product series AK*

Prepared	07/08/2018 Naoyuki Suga
Checked	-
Approved	07/08/2018 Hirosuke.Yamada

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_{10} / B_{10D} data

Based on the following endurance test results and assuming a failure mode following the Weibull distribution the following B_{10} and B_{10D} data have been estimated. (90% confidence level).

Series models	**B_{10}**	**B_{10D}**	Pressure MPa
AK* series	7.4million cycles	14.8million cycles	0.5

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_{10D} value is based on the provided B_{10} value using B_{10}×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 B10 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

The ISO 13849-1 standard defines a well-tried 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-tried 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-tried 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 I A-5	B-1	B-2	B-3 I B-18	D-1	D-2	D-3 I D-21
AK* series	●	●	-	●	●	-	–	–	-

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

A-2 , B-2 , D-2 : Well-tried 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. Use of components with oriented failure mode
2. Valve not closed by air pressure

Refer to IM No.□AKB-SMW35、AKH-SMW36 for details

Refer to the following how to order for validated products

Straight type AKH 04 – 00

Male connector type AKH 04 A – □ 01 S

Applicable tubing O.D.

Metric size		Inch size	
04	ø4	03	ø5/32
06	ø6	07	ø1/4
08	ø8	09	ø5/16
10	ø10	11	ø3/8
12	ø12	13	ø1/2

Thread type

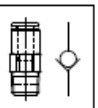
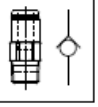
Nil	Metric thread (M5)
	Unified thread (10-32 UNF)
	R
N	NPT

With seal (Standard)
* M5 and 10-32 UNF types are not required.

Port size

M5	M5 x 0.8
U10/32	10-32 UNF
01	1/8
02	1/4
03	3/8
04	1/2

Check valve free flow direction

A	From male thread to One-touch fitting	
B	From One-touch fitting to male thread	

Applicable Tubing O.D./Port Size Combinations

Metric size

Model	Applicable tubing O.D.	R thread M5	1/8	1/4	3/8	1/2
AKH04□	ø4	●	●			
AKH06□	ø6	●	●	●		
AKH08□	ø8		●	●	●	
AKH10□	ø10			●	●	●
AKH12□	ø12				●	●

Inch size

Model	Applicable tubing O.D.	NPT thread 10-32 UNF	1/8	1/4	3/8	1/2
AKH03□	ø5/32	●	●			
AKH07□	ø1/4	●	●	●		
AKH09□	ø5/16		●	●	●	
AKH11□	ø3/8			●	●	●
AKH13□	ø1/2				●	●

Bushing type AKB 01 A – □ 01 S

Body size

01	1/8
02	1/4
03	3/8
04	1/2

Thread type

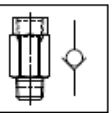
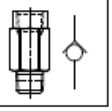
Nil	R
N	NPT

With seal (Standard)

Port size

01	1/8
02	1/4
03	3/8
04	1/2

Check valve free flow direction

A	From male to female thread	
B	From female to male thread	

Female/Male Threads Combinations

R thread

Model	Female thread Rc	Male thread R 1/8	1/4	3/8	1/2
AKB01□	1/8	●			
AKB02□	1/4		●		
AKB03□	3/8			●	
AKB04□	1/2				●

NPT thread

Model	Female thread NPT	Male thread NPT 1/8	1/4	3/8	1/2
AKB01□	1/8	●			
AKB02□	1/4		●		
AKB03□	3/8			●	
AKB04□	1/2				●