

Reliability Data for: Product series VHS-A VHS-B

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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.

B₁₀ / B_{10D} data

Based on the following endurance test results and assuming a failure mode following the Weibull distribution the following B₁₀ and B_{10D} data have been estimated. (90% confidence level).

Series models	B ₁₀	B _{10D}	Pressure MPa
VHS20-A, VHS20-B series VHS2510 series	15,000 cycles	30,000 cycles	1.0
VHS30-A, VHS30-B series VHS40-A, VHS40-B series VHS50-A, VHS50-B series VHS3510-A, VHS3510-B series VHS4510-A, VHS4510-B series VHS5510-A, VHS5510-B series	26,000 cycles	52,000 cycles	1.0

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 B₁₀ value using B₁₀×2 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

SMC have tested this product in laboratory conditions to establish the life time data which can be supplied to you as an estimated B₁₀ 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-trying 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
VHS**-A series VHS**-B series VHS*510-A series VHS*510-B series	●	●	-	●	●	-	-	-	-

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.

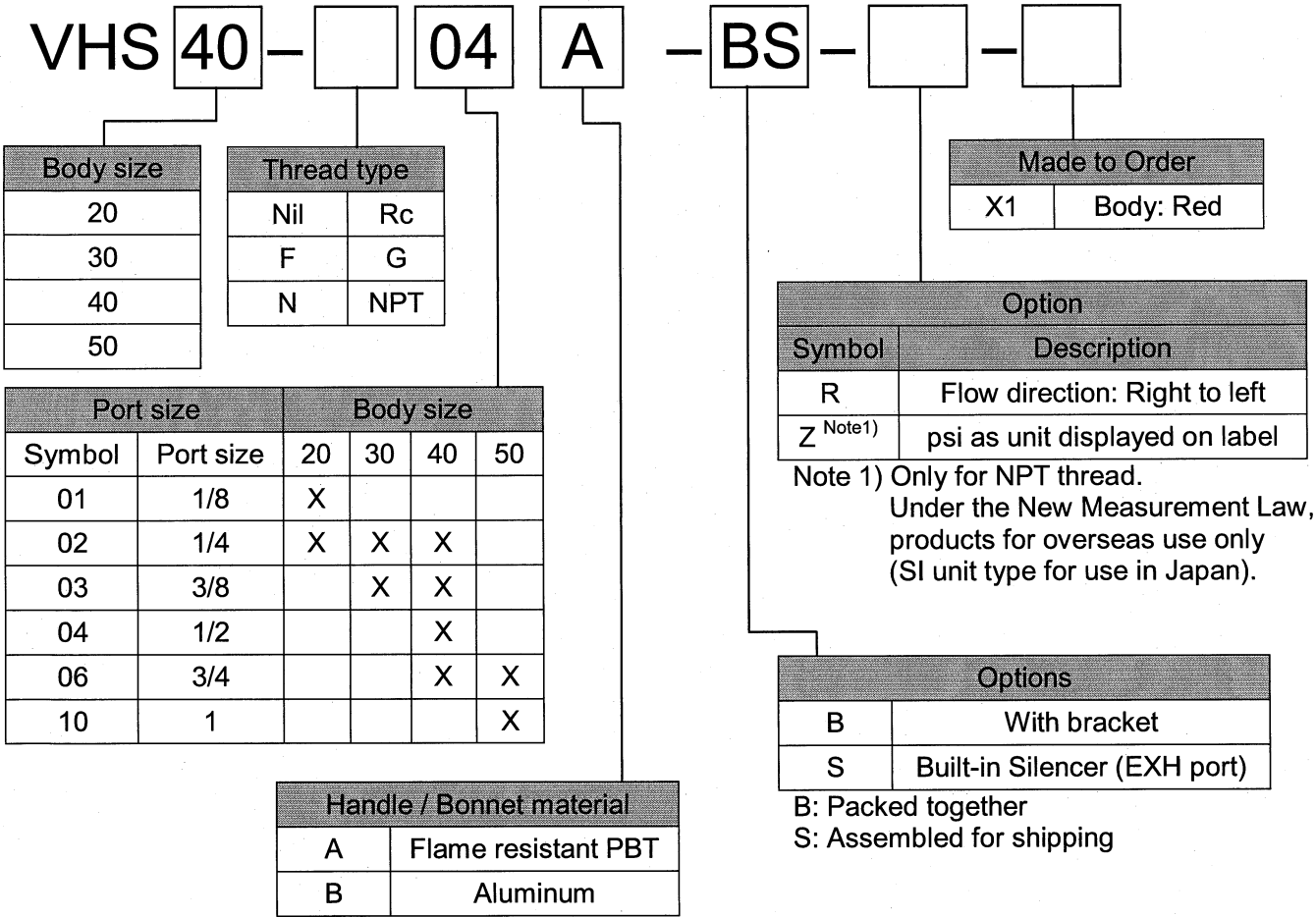
Exceptions: the component does not meet the following relevant safety principles.

1. - Oriented failure mode (A-2)

Refer to IM No.VHS-SMU28 for details

Refer to the following how to order for validated products

(1) Single action type



(2) Double action type

VHS

4

510

-

04

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BS

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-

Body size
2
3
4
5

Double Action

Thread type	
Nil	Rc
F	G
N	NPT

Port size		Body size			
Symbol	Port size	2	3	4	5
01	1/8	X			
02	1/4	X	X	X	
03	3/8		X	X	
04	1/2			X	
06	3/4			X	X
10	1				X

Handle / Bonnet material	
A	Flame resistant PBT
B	Aluminum

Made to Order	
X1	Red body

Option	
Symbol	Description
R	Flow direction: Right to left
Z ^{Note1}	psi as unit displayed on label

Note 1) Only for NPT thread.
Under the New Measurement Law,
products for overseas use only
(SI unit type for use in Japan).

Options	
B	With bracket
S	Built-in Silencer (EXH port)

B: Packed together
S: Assembled for shipping