Reliability Data for: Product series VNB(20,30,40)-X700

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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_{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
VNB(20,30,40)1-X700	2 million cycles	4 million cycles	0.5
VNB(20,30,40)(2,4)-X700	2 million cycles	4 million 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 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 B_{10} 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_{10} value.
The target life was reached with no failures under those laboratory conditions.

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
VNB(20,30,40)-X700	●	●	-	●	●	-	-	-	-

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(A-2)
2. Valve closed by load pressure(B-2)

This document does not include the design review of auto switches that will be installed by the user. Please contact SMC for the reliability data of the auto switch.

Refer to IM No. VNB-SMW63

Refer to the following how to order for validated products

How to order
VNB20-X700,VNB30-X700,VNB40-X700

V N B 2 0 1 A □ - 15A - □ - □ □ □ - X 7 0 0

・Seal material

A	NBR
B	FKM

・Body material

Nil	Bronze
S	Stainless
L	Aluminum

・Bracket

Nil	None
B1	Bracket on the left side
B2	Bracket on the right side

・Valve size / ・Valve type / ・Port size

Symbol	Orifice dia. (mm)	Symbol 1 N.C. 0.5MPa	Symbol 2 N.O. 1.0MPa	Symbol 4 N.C. 1.0MPa	Symbol	Port size Rc
2	φ11	–	–	●	10A	3/8
	φ15	●	●	–		
	φ11	–	–	●	15A	1/2
	φ15	●	●	–		
3	φ14	–	–	●	20A	3/4
	φ20	●	●	–		
4	φ16	–	–	●	25A	1
	φ25	●	●	–		

・Number of Auto switches

Nil	2 pcs
S	1 pc

・Auto swich lead wire length

Nil	0.5m
M	1m
L	3m
Z	5m

0.5m(Nil),1m(M),and 5m(Z) for D-M9□A will be produced upon receipt of order.

・Magnet used in auto switch/auto switch part no

Nil	Without auto switch (without magnet)
M	Without auto switch (with built-in magnet)
A	D-M9N
B	D-M9P
C	D-M9B
E	D-M9NA
F	D-M9PA
G	D-M9BA