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Article: **NA B110BB-DN2**
Description: Modular prewired switch with roller plunger

Housing:

Metal housing, 20 mm fixing points.

General data:

Corrosion resistance housing in saline mist: ≥ 300 hours in NSS according to ISO 9227
Max actuation frequency: 3600 operations cycles/hour
Mechanical endurance: 20 million operations cycles
B10d: 40,000,00 for NC contacts
Mechanical interlock, not coded: type 1 according to EN ISO 14119
Vibration resistance: 5 … 150 Hz (7.9 m/s2) according to EN 61373 cl.9

Contact block characteristics:

1NO+1NC snap action (B11)
Double breaking.

Positive switch opening:

Device with positive opening conforming to IEC 60947-5-1.

Travel diagram:

- Closed contact
- Opened contact
- Positive opening travel (IEC 60947-5-1)
- Opening travel 2x2m (EN 81)
- Reset device travel
- Pushing the switch
- Releasing the switch
- Tripping mechanical point

Device screw tightening torques:

Head screws:	0.5 … 0.7 Nm
Lever screws:	0.8 … 1.2 Nm
Connector screw:	0.3 … 0.6 Nm

M4 fixing screws, body : 2 … 3 Nm

In conformity with requirements requested by:

Low Voltage Directive 2014/35/EU, Electromagnetic Compatibility Directive 2014/30/EU, RoHS Directive 2011/65/EU.

Activating forces:

Min.: 7 N
Positive opening: 25 N

In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, ISO 20653, UL 508, CSA 22.2 No.14.

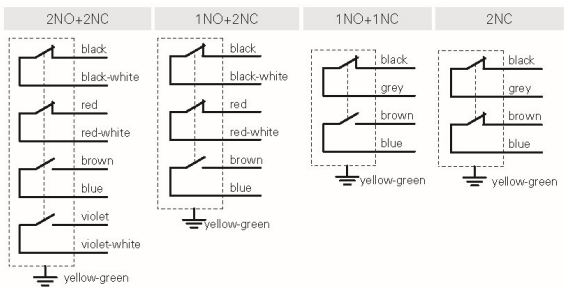
Markings and quality marks:

Electrical data:

Rated impulse withstand voltage (U_{imp}): 4 kV
Conditional short circuit current: 1000 A according to EN 60947-5-1
Pollution degree: 3

Important: Switch off the circuit voltage before disconnecting the connector from the switch. The connector is not suitable for separation of electrical loads. According to EN 60204-1, 2NO+2NC versions with 8-pin M12 and AMP connector can be used only in PELV circuits.

Internal connections:



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Utilization temperatures and electrical data:

	Connection type	Output with cable						Output with M12 connector		Output with AMP connector
	Contact block	2 contacts			3 contacts	4 contacts		2 contacts	3 or 4 contacts	2 contacts
Cable features	Cable or connector type	N	G	H	N	N	H	M12 connector, 5-pole	M12 connector, 8-pole	AMP Superseal 1.5 connector
	Conductors	4x0.75 mm²	4x0.75 mm²	4x0.75 mm²	6x0.5 mm²	8x0.34 mm²	8x0.34 mm²	4x0.25 mm2	8x0.25mm2	
	Application field	General	General	General, mobile installation	General	General	General, mobile installation	General	General	General
	In compliance with standards	05VV-F	05VV-F	05EQ-H	03VV-F	03VV-F	03E7Q-H	03VV-H	03VV-H	/
	Sheath	PVC	PVC	PUR HALOGEN FREE	PVC	PVC	PUR HALOGEN FREE	PVC	PVC	/
	Self-extinguishing	IEC 60332-1-2 IEC 60332-1-3	IEC 60332-1-2 IEC 60332-1-3 IEC 60332-3 CEI 20-22 II	IEC60332-1-2 IEC60332-1-3	IEC 60332-1-2 IEC 60332-1-3	IEC 60332-1-2 IEC 60332-1-3	IEC60332-1-2 IEC60332-1-3	IEC60332-3 CEI 20-22 II	IEC60332-3 CEI 20-22 II	/
	Oil resistant	/	/	UL 758	/	/	UL 758	ISO 6722-1	ISO 6722-1	/
	Max. speed	/	/	300m/min	/	/	300m/min	50m/min	50m/min	/
	Max. acceleration	/	/	30m/s²	/	/	30m/s²	5m/s²	5m/s²	/
	Minimum bending radius	70 mm	70 mm	70 mm	108 mm	94mm	70 mm	75 mm	90 mm	/
	Outer diameter	7 mm	7 mm	7 mm	7 mm	7 mm	7 mm	5 mm	5 mm	/
	End stripped	80 mm	80 mm	80 mm	80 mm	80 mm	80 mm	/	/	/
	Copper conductors IEC 60228	Class 5	Class 5	Class 6	Class 5	Class 5	Class 6	Class 6	Class 6	/
Ambient temperature with cable standard extended (T6)	Cable, fixed installation	-25°C +70°C	-25°C +70°C	-25°C +80°C	-25°C +80°C	-25°C +80°C	-25°C +80°C	-25°C +80°C	-25°C +80°C	/
	Cable, flexible installation	+5°C +70°C	+5°C +70°C	-25°C +80°C	-5°C +80°C	-5°C +80°C	-25°C +80°C	-25°C +80°C	-25°C +80°C	/
	Cable, mobile installation	/	/	-25°C +80°C	/	/	-25°C +80°C	-15°C +80°C	-15°C +80°C	/
	Cable, fixed installation	/	/	-40°C +80°C	/	/	-40°C +80°C	/	/	/
	Cable, flexible installation	/	/	-40°C +80°C	/	/	-40°C +80°C	/	/	/
	Cable, mobile installation	/	/	-40°C +80°C	/	/	-40°C +80°C	/	/	/
Electrical data	Thermal current Ith	10 A	10 A	10 A	6 A	3 A	3 A	4 A	2 A	10 A
	Rated insulation voltage Ui	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac 300 Vdc	30 Vac 36 Vdc	250 Vac 300 Vdc
	Protection against short circuits (fuse)	10 A 500 V type gG	10 A 500 V type gG	10 A 500 V type gG	6 A 500 V type gG	3 A 500 V type gG	3 A 500 V type gG	4 A 500 V type gG	2 A 500 V type gG	10 A 500 V type gG
	Utilization category DC13 — 24 V	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A
	Utilization category DC13 — 125 V	0.4 A	0.4 A	0.4 A	0.4 A	0.4 A	0.4 A	0.4 A	/	0.4 A
	Utilization category DC13 — 250 V	0.3 A	0.3 A	0.3 A	0.3 A	0.3 A	0.3 A	0.3 A	/	0.3 A
	Utilization category AC15 — 24 V	4 A	4 A	4 A	4 A	3 A	3 A	4 A	2 A	4 A
	Utilization category AC15 — 120 V	4 A	4 A	4 A	4 A	3 A	3 A	4 A	/	4 A
	Utilization category AC15 — 250 V	4 A	4 A	4 A	4 A	3 A	3 A	4 A	/	4 A
	Approvals	CE cULus IMQ EAC CCC	CE EAC CCC	CE EAC	CE cULus IMQ EAC CCC	CE cULus IMQ EAC CCC	CE EAC	CE cULus IMQ EAC CCC	CE cULus EAC CCC	CE cULus EAC CCC

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Characteristics approved by IMQ
Rated insulation voltage (Ui): 250 Vac
Conventional free air thermal current (Ith): 10 A (1-2 contacts) / 6 A (2-3 contacts)
4 A (4 contacts or 5-pin M12 connector)
Protection against short circuits (fuse): 10 A (1-2 contacts) / 6 A (2-3 contacts)
/ 4 A (4 contacts or 5-pin M12 connector), gG type
Rated impulse withstand voltage (Uimp): 4 kV
Protection degree of the housing: IP67
MA terminals (saddle clamps)
Pollution degree: 3
Utilization category: AC15 / DC13 (with connector)
Operating voltage (Ue): 250 Vac (50 Hz) / 24 Vdc (with connector)
Operating current (Ie): 3 A / 2 A (with connector)
Forms of the contact element: X, Y, X+Y, X+X, Y+Y, Y+Y+X, X+X+Y, X+X+Y+Y, Zb
Positive opening of contacts on contact blocks B01, B11, B02, B12, B21, B22,
G01, G11, G02, G12, G21, G22, L01, L11, L02, L12, L21, L22, H01, H11, H02
H12, H21, H22
In conformity with standards: EN 60947-1, EN 60947-5-1 + A1:2009,
fundamental requirements of the Low Voltage Directive 2006/95/EC.

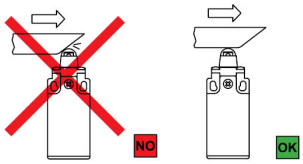
Characteristics approved by UL
Utilization categories R300 pilot duty (28 VA, 125-250 Vdc)
B300 pilot duty (360 VA, 120-240 Vac) (1-2-3 cont.)
C300 pilot duty (180 VA, 120-240 Vac) (4 cont.)

Data of housing type 1, 4X “indoor use only”, 12.
Housing data for versions with 1-2 contacts and type N cable
type 1, 4X "indoor use only"

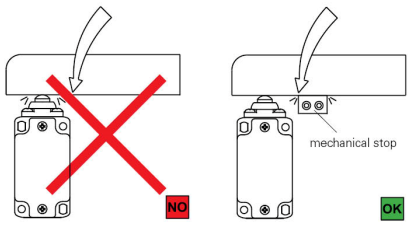
In conformity with standard: UL 508, CSA 22.2 No.14

Mechanical stop

Acc. to EN ISO 14119 paragraph 5.2 “the position sensors must not be used as mechanical stop”.



The actuator must not exceed the max. travel as indicated in the travel diagrams.

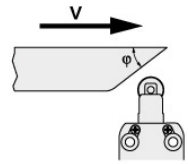


The guard must not use the switch head as a mechanical stop.

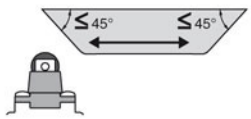
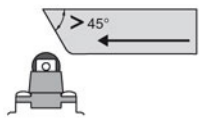
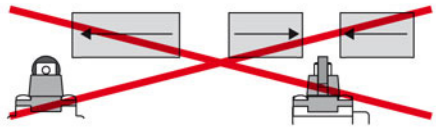
Actuation speed

φ	Vmax (m/s)	Vmin (mm/s) L	Vmin (mm/s) R
15°	1	4	0,04
30°	0,5	2	0,02
45°	0,3	1	0,01

Contacts type:
R = snap action
L = slow action



Actuation modality

Recommended application	Application to avoid Possible application but with mechanical stress for the switch higher than expected, mechanical endurance is not guaranteed	Forbidden application
		

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Installation of single switches with safety functions

- Use **only** switches with the symbol ⊖.
- Connect the safety circuit to **the NC normally closed contacts (11-12, 21-22 or 31-32).**
- **The NO normally open contacts (13-14, 23-24, 33-34)** should be used **only for signalling**; these contacts are not to be connected with the safety circuit. However, if two or more switches are used on the same guard, a connection can be established between the NO contacts and the safety circuit.
  In this case at least one of the two switches must have positive opening and a normally closed contact NC (11-12, 21-22 or 31-32) must be connected to the safety circuit.
- Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams with symbol ⊖.
- The actuation system must be able to exert a force that is greater than the **positive opening force**, as specified in brackets below each article, next to the minimum force value.
- The device must be affixed in compliance with EN ISO 14119.

Whenever the machine guard is opened and during the whole opening travel, **the switch must be pressed directly** (fig. 1) **or through a rigid connection** (fig. 2)**.**
Only in this way the positive opening of the normally closed NC contacts (11-12, 21-22, 31-32) is guaranteed.

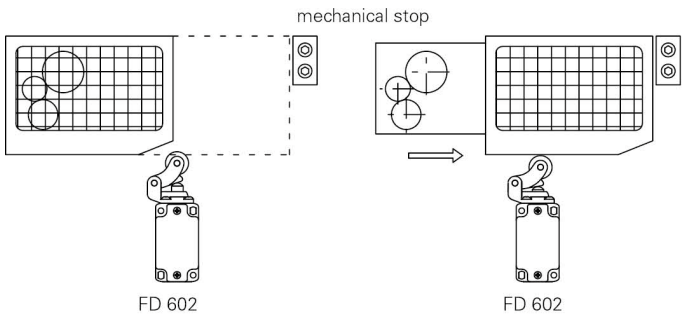

Fig.1

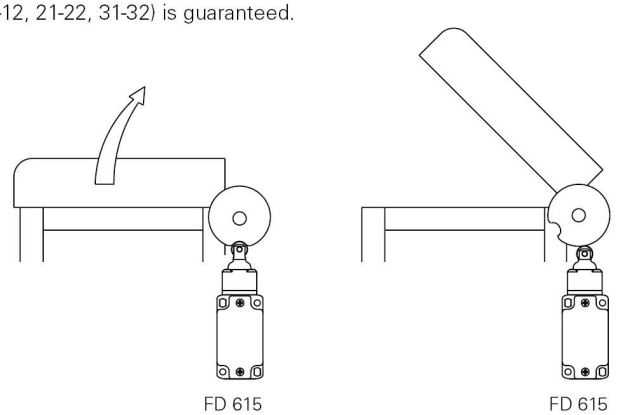

Fig.2

In safety applications with only one switch for each guard, the switches **must never be activated by a release** (fig. 3 and 4) **or through a non rigid connection** (i.e. by a spring).

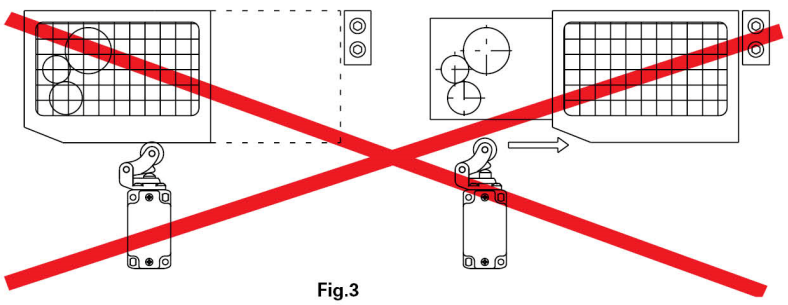

Fig.3

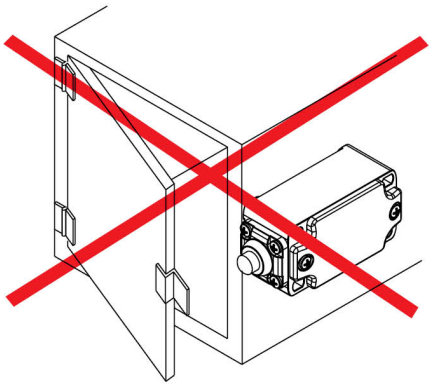

Fig.4