Vibrating fork level detector
NIVASWITCH

USER MANUAL

BAMO INTERNATIONAL
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Vibrating fork level detector
NIVASWITCH
23-11-2021 M-513.03-EN-AA

NIV
513-03 /1

1. PRECAUTIONS

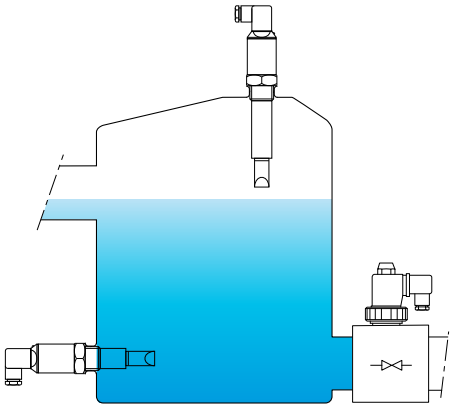
- Installation, commissioning and maintenance operations must only be performed by qualified personnel.
- Connect the device to a suitable supply voltage as indicated in the technical features.
- Turn off the main supply before any installation and maintenance works.
- Operate the device only in accordance with the conditions described in this manual.

2. DESCRIPTION

NIVASWITCH is easy to use and can detect most liquids. It works independently of electric conductivity, clogging, turbulences, flow, and, air bubbles. The trigger point depends of the stem length and immersion depth.

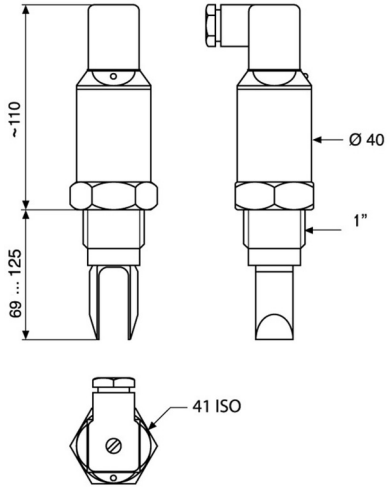
Robust and compact, NIVASWITCH may be mounted vertically or horizontally. Easy to install, it does not require adjustement, neither maintenance. It has an operating indicator (LED) and a "test" function (using a magnet).

The output signal may be connected to a PLC. As options, the relays PKK (data-sheet 251-02) and LC1, allow to convert the output signal in a potential free switch output.



Examples of use

3. DIMENSIONS



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NIV

513-03 /2

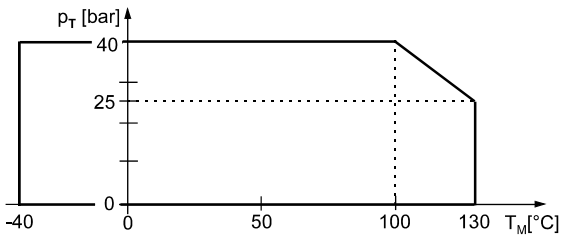
4. TECHNICAL FEATURES

Insertion length:	Or 69 mm or 125 mm (from sealing surface)
Wet part material:	AISI 316 Ti (1.4571)
Liquid temperature:	-40 ... 130 °C (see the temperature limits diagrams)
Ambient temperature:	-40 ... 70 °C (see the temperature limits diagrams)
Liquid pressure:	Max. 40 barg (See the diagram: pressure vs. temperature)
Liquid S.G.:	≥ 0.7
Viscosity:	≤ 10,000 mm²/s (cSt)
Response time:	0.5 s (Immersed probe) ≤1 s when probe getting outside the liquid (See diagram response time vs. viscosity)
Output signal status:	Two-color LED
Test function:	With a magnet (report to § "Test function")

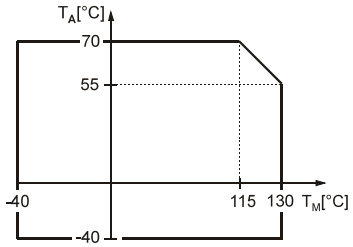
Type		2-wire and AC	3-wire and DC
Reference		**CM69AC / CM125AC**	**CM69DC / CM125DC**
Connector		DIN	DIN
Protection		IP65	IP65
Mode setting HIGH / LOW		Via wiring on connector	Set via DIP
Output		2-wire; AC	PNP / NPN
Output protection		-	Against reverse polarity, overload and short circuit
Supply		20 ... 255 V AC 50/60 Hz	12 ... 55 V DC
Consumption		Depends of load	< 0.6 W
Voltage drop at status changing		< 10.5 V	< 4.5 V
Electric protection		Class I	Class III
Load current	In continuous; Maximum	350 mA AC	Imax = 350 mA DC / Umax = 55 V DC
	In continuous; Minimum	10 mA / 255 V ; 25 mA / 24 V	-
	On peak	1.5 A / 40 ms	-
Residual current at status changing		< 6 mA	< 100 µA

EC Conformity: The instrument meets the legal requirements of the current European Directives.

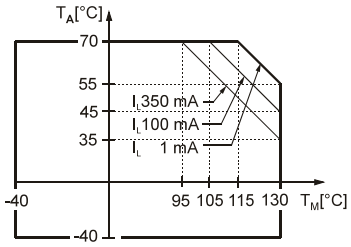
5. DIAGRAMS: TEMPERATURE, PRESSURE, RESPONSE TIME, VISCOSITY



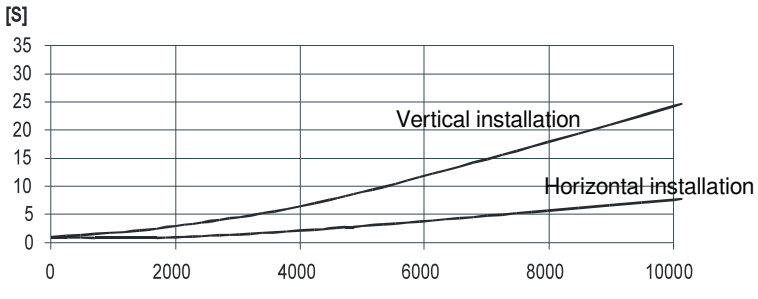
Pressure vs. Temperature (liquid)



Version AC: Temperature limits
Ta = Ambient temperature; Tm = Liquid temperature



Version DC: Temperature limits
Ta ambient temperature; Tm liquid temperature; load current



Response time vs. viscosity

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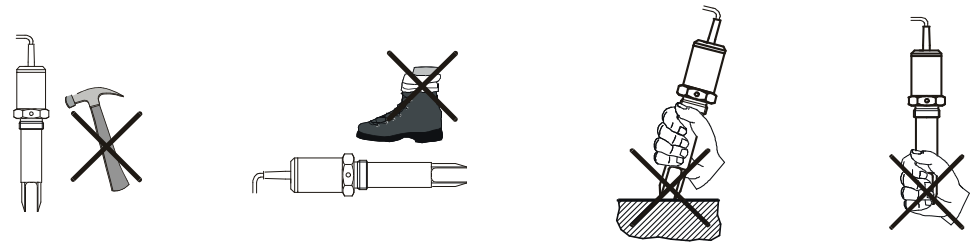
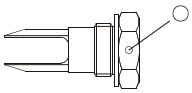
6. COMMISSIONING

Avoid any mechanical impact on the probe:



To position the vibrating blades in the fluid direction, use the mark located on the hexagonal fitting.

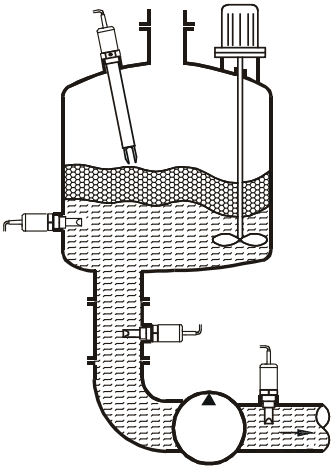
CAUTION: Do not use the connector/ housing to screw the device on the container. Use only the 41mm hexagonal nut for tightening.



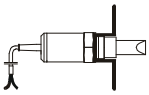
Horizontal mounting:
- Use PTFE tape to seal the assembly.
- Position the blades such as the liquid flows vertically between the 2 blades.

Low viscosity liquids:
With a low viscosity liquids (without risk of deposit on the blades): All the assemblies described on the drawings are possible.

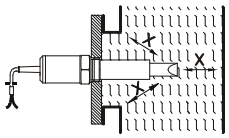
High viscosity liquids:
With a highly viscous liquid (with a risk of deposit on the blades): Only the vertical mounting from the top is acceptable.



Threaded fitting BSP-M

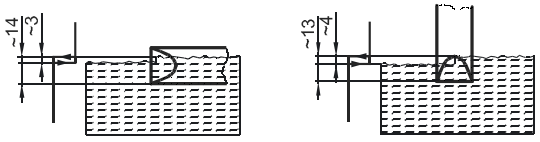


Proximity critical distance: x > 5 mm



On-line, the blades must be parallel to the direction of flow of the fluid

7. TRIGGER POINT



The trigger point depends of liquid S.G. and mounting position.

Switching point and differential for water at 25 °C

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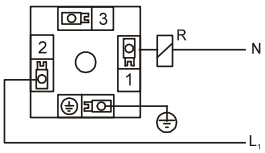
8. ELECTRICAL CONNECTION

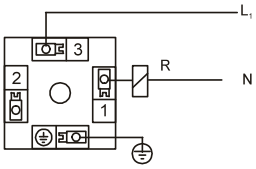
Note: The terminal block cover can be rotated up to 90° to position the cable correctly.

- **Version: 2-wire, AC**

WARNING
DO NOT USE WITHOUT EXTERNAL LOAD
ALWAYS INSERT A LOAD (RESISTOR) IN THE POWER LOOP



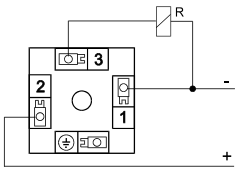
LOW level detection



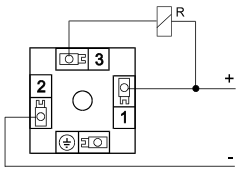
HIGH level detection

- **Version: 3-wire, DC**
- In the event of an overload caused by a short circuit, the transistor keeps switching and the LED flashes.

PNP or NPN connection

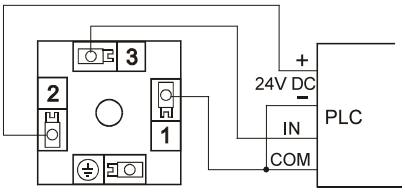


PNP



NPN

Connection to a PLC



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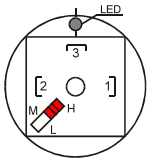
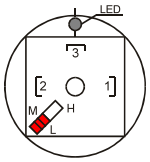
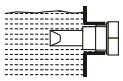
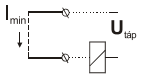
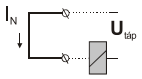
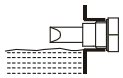
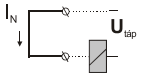
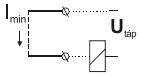
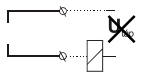
9. DIP SETTING

Check the connection of the wires and the operating mode (M):

	
H = High level detection	**L = Low level detection**

NIVASWITCH operation according to the selected mode:

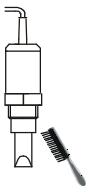
Power supply	Probe	Mode	LED status	Output	
ON	 in immersion	HIGH	RED	LED lit off	
		LOW	GREEN	LED lit on	
	 Without liquid	HIGH	GREEN		
		LOW	RED	LED lit off	
OFF	with/without liquid	HIGH or LOW	LED lit off		

10. TEST FUNCTION

The switching circuit of the device can be tested with a magnet.
Position the magnet in front of the mark on the housing.
The LED status changes.

11. MAINTENANCE, CLEANING

In some cases, the probe may require a cleaning to remove deposits. This should be done gently, without damaging the vibrating section of the NIVASWITCH.



12. STORAGE CONDITIONS

Ambient temperature	-25 ... 60 °C
Relative humidity	Max. 98 %

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