Liquid Level Switches

for Liquids

- Repeatability: ±1 mm
- p_{max}: 50 bar
  t_{max}: 130 °C,
  150 °C (for CIP)
- Connections:
  Pipe screw joints, NPT,
  Flange, hygienic thread
- Material:
  Stainless steel 1.4404
- Viscosity: max. 5000 mm²/s
- No moving parts
- Insensitive to plant vibrations

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Description

The KOBOLD liquid level switch NWS is designed as a 2 and 3-wire switch and can be universally used in vessels and pipelines. The NWS operates on the tuning fork principle in air at resonance frequency. A piezoelectric crystal is used for excitation of oscillations and for monitoring the actual oscillation frequency. When the fork is immersed in liquid, the frequency changes: this change is detected electronically and the output signal is changed. The NWS operates as a two-wire switch in series with the load. The simple electronic switch is operated by the liquid. The NWS can also be connected to a PLC through a third terminal.

Special features

The NWS has an output state indicator with an LED that can be seen though a lens in the cover. The LED flashes about once a second when the NWS has switched off and is permanently illuminated when the NWS is switched on. The LED is an optical confirmation that the NWS is working correctly and the condition of the wet side is correctly displayed. The NWS can be set as upper or lower limiter with a mode selector.

Applications

- Oils
- Water
- Paints and transparent inks
- Sauces
- Milk
- Liquids containing carbon dioxide
- Foamed oils

The NWS is ideal for hygienic and sterile applications and for CIP cycles up to 150 °C.

Technical Details

NWS-...200..:	glass-fibre-reinforced nylon, orange, black cover with window, housing 330° rotatable
NWS-...23/24/2W/2H/2E..:	Stainless steel 1.430x, cover PA6, NWS-2E: cover 1.430x
Process connection:	Pipe thread, NPT thread, Tri-Clamp, Pipe connection DIN 11851 (sanitary connection), Aseptic-connection DIN 11864, DRD flange, Flange B 25 PN 40 DN 2527, Flange B 50 PN 40 DN 2527, Flange ANSI B 16,5 - 1", 300 lbs, Flange ANSI B 16,5 - 2", 300 lbs
Sensor material:	Stainless steel 1.4404
Protection:	IP 65
Max. operating pressure:	50 bar between -40 °C and +50 °C 45 bar at 130 °C Flange connection: see pressure steps
Max. medium temp.:	130 °C (NWS-..200..) 90 °C (for all other NWS) short-time 150 °C for CIP (valid for all models NWS)
Ambient temperature:	-20 °C ... +70 °C
Min. immersion depth for switch points:	12 mm (marker on fork)

Power supply

NWS-...200..:	24 ... 240 $V_{DC/AC}$ (50/60 Hz); 2-wire 24 V_{DC}; 3-wire
NWS-...23/24/2W/2H..:	24 V_{DC} ± 20%, ripple 5%
NWS-...2E..:	U_0 ~ 8.2 V_{DC} (typ.) Ik ~ 8.2 mA (typ.) Isolation Switching Amplifier to NAMUR IEC 60947-5-6 necessary (for example: REL-6)
Delay:	1 s wet/dry 1 s dry/wet
Viscosity:	5000 mm²/s max. at 25 °C (response time can be increased)
Hysteresis:	4 mm vertical, 1 mm horizontal
Repeatability:	± 1 mm
Weight:	0.5 kg (for R ¾ and ¾ NPT)

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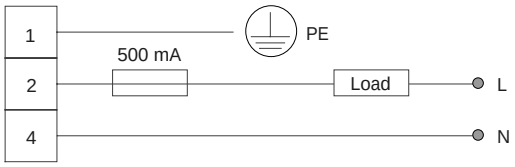
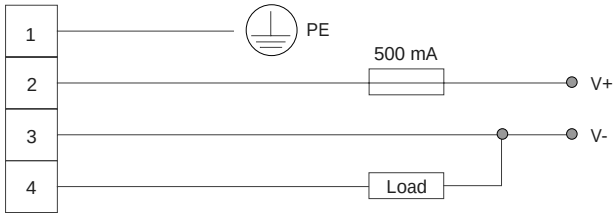
Electrical connection

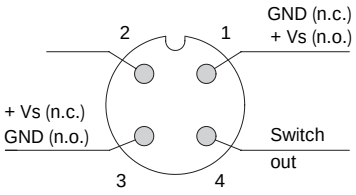
NWS-R2*200...
2wire 24-240 $V_{AC/DC}$, serial Load, $I_{max} \leq 500$ mA



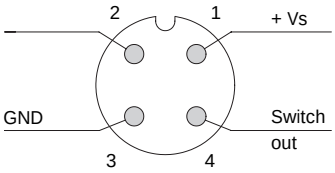
3-wire, $V_S = 24\ V_{DC}$
Output PNP: $U_{HIGH} \sim 16{,}5$ V; $U_{LOW} \sim 2{,}5$ V; $I_{max} \leq 500$ mA



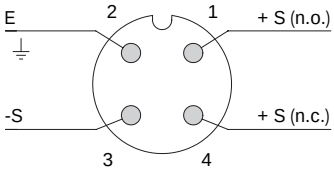
NWS-...23/24 (24 V_{DC})



NWS-...2W/2H (WHG)



NWS-...2E... (NAMUR, ATEX)



Wiring diagram

Colour of core	NWS-...23/24	NWS-...2W/2H
brown	+ Vs (n.o.) / GND	+ Vs
blue	GND / + Vs (n.c.)	GND
Black	Swich out	Swich out

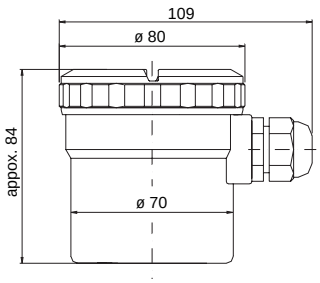
Number of core	NWS-...2E
1	+ S (n.o.)
2	Earth
3	– S
4	+ S (n.c.)

Order Details (Example: NWS-R20 20 0 0000)

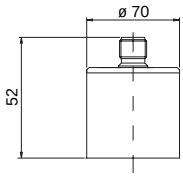
Connection	Model	Electrical connection	Sensor version
R 3/4 male thread	NWS-R20...	Plastic housing 200 = 24...240 $V_{AC/DC}$ Cable or terminal screwing St. steel housing/plug connection 23S = 24 V_{DC}, PNP, Plug conn. M12x1 24S = 24 V_{DC}, NPN, Plug conn. M12x1 2WS = 24 V_{DC}, WHG, PNP, Plug M12x1 2HS = 24 V_{DC}, WHG, NPN, Plug M12x1 2ES = Namur with ATEX, Plug M12x1 St. steel housing/cable connection 23F = 24 V_{DC}, PNP, 1.5 m cable 24F = 24 V_{DC}, NPN, 1.5 m cable 2WF = 24 V_{DC}, WHG, PNP, 1.5 m cable 2HF = 24 V_{DC}, WHG, NPN, 1.5 m cable 2EF = Namur with ATEX, 1.5 m cable	0070 = 70 mm compact-version, short 0117 = 117 mm standard-version, long 0300 = 300 mm sensor** 0500 = 500 mm sensor** 1000 = 1000 mm sensor** XXXX = please specify special length 4-position in mm (max. 3000 mm)**
R 1 male thread	NWS-R25...*		
3/4 NPT male thread	NWS-N20...		
1 NPT male thread	NWS-N25...*		
DIN flange DN 25	NWS-F25...		
DIN flange DN 50	NWS-F50...*		
1" ANSI flange	NWS-A25...		
2" ANSI flange	NWS-A50...*		
Tri-Clamp DN 40	NWS-T40...		
Tri-Clamp DN 50	NWS-T50...		
Sanitary con. DN 40 (DIN 11851)	NWS-L40...		
Sanitary con. DN 50 (DIN 11851)	NWS-L50...		
Aseptic con. DN 50 (DIN 11864)	NWS-H50...		
DRD Ø 125 mm flange	NWS-D1Z...		
Special connection	NWS-YYY...		

only models marked with *are available with sensor version (...3, ...5, ...y).

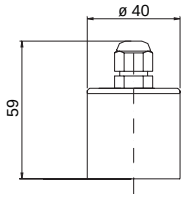
NWS-...200



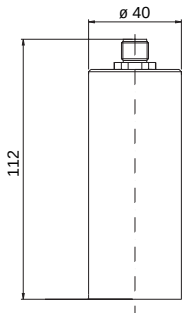
NWS-...23S/24S
NWS-...2WS/2HS



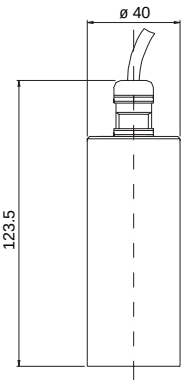
NWS-...23F/24F
NWS-...2WF/2HF



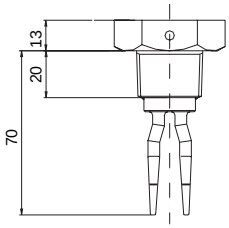
NWS-...2ES



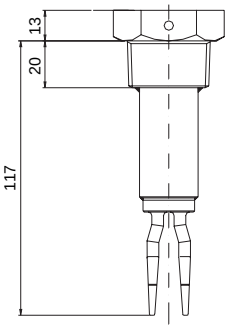
NWS-...2EF



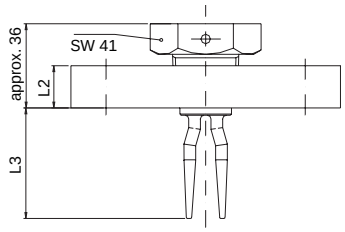
NWS-R20/N20



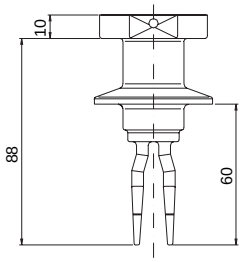
NWS-R25/N25



NWS-F.../NWS-A...

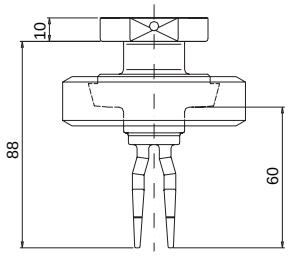


NWS-T...

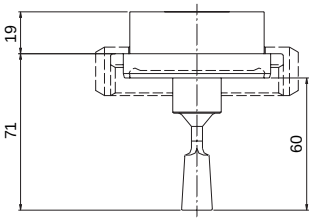


	L 2	L 3
DN 25 / PN 40	18	approx. 47
DN 50 / PN 40	20	approx. 95
ANSI 1" 300 lbs	17.5	approx. 41
ANSI 2" 300 lbs	22.4	approx. 92

NWS-L...



NWS-H...



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