



Zertifiziertes  
QM-System  
DIN EN ISO 9001  
Zertifikat-Nr. 01017

## Liquid Level Switches

According to the Tuning Fork Principle



measuring  
•  
monitoring  
•  
analysing



- Repeatability:  
 $\pm 1 \text{ mm}$
- $p_{\text{max}}$ : 50 bar  
 $t_{\text{max}}$ : 130 °C,  
150 °C (for  
CIP process)
- Connections:  
Pipe screw joints, NPT,  
Flange, hygienic thread
- Material:  
Stainless steel 1.4404
- Viscosity:  
max. 5000 mm<sup>2</sup>/s
- No moving parts
- Insensitive to plant  
vibrations
- ATEX version

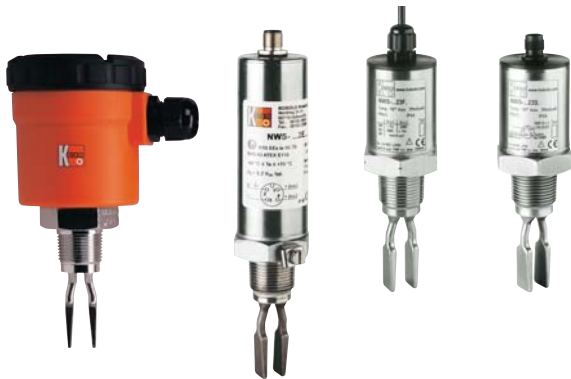


KOBOLD companies worldwide:

ARGENTINA, AUSTRIA, BELGIUM, CANADA, CHILE, CHINA, CZECH  
REPUBLIC, FRANCE, GERMANY, GREAT BRITAIN, INDONESIA, ITALY,  
MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, SWITZERLAND,  
SINGAPORE, SLOVAKIA, THAILAND, USA, VENEZUELA, VIETNAM

KOBOLD Messring GmbH  
Nordring 22-24  
D-65719 Hofheim/Ts.  
☎ +49(0)6192 299-0  
Fax +49(0)6192 23398  
E-Mail: info.de@kobold.com  
Internet: www.kobold.com

Model:  
NWS



### 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 through 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.

#### ATEX-version:

- type of protection: intrinsically safe ia
- designation:  II 1G EEx ia IIC T6
- to use in connection with intrinsically safe Isolation Switching Amplifier according to IEC 60947-5-6

### Technical Details

#### Material

Fork: stainless steel 1.4404  
 Process connection: stainless steel 1.4404  
 Electronic housing: NWS-...200: PAG, glass-fibre-reinforced cover with window, 330° rotatable  
 all other types: stainless steel 1.4301

Process connections: Pipe thread DIN EN 10226-1, 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

Protection: plastic housing: IP 65 (NWS-...200)  
 stainless steel housing, plug connection: IP 67  
 stainless steel housing, cable connection: IP 68

Max. operating pressure: 45 bar  
 Flange connection: see pressure steps

Max. medium temp.: 130 °C (NWS-...200..)  
 80 °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<sub>DC/AC</sub> (50/60 Hz); 2-wire; 24 V<sub>DC</sub>, 3-wire

NWS-...23/24/2W/2H.: 24 V<sub>DC</sub>, 3-wire

NWS-...2E..(ATEX): Isolation Switching Amplifier to IEC 60947-5-6 (Namur) necessary (for example: REL-6)

Delay: 1 s wet/dry  
 1 s dry/wet

Viscosity: 5000 mm<sup>2</sup>/s max. at 25 °C (response time can be increased)

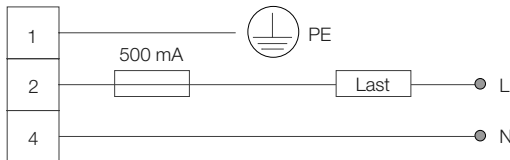
Hysteresis: 4 mm vertical, 1 mm horizontal

Repeatability: ± 1 mm

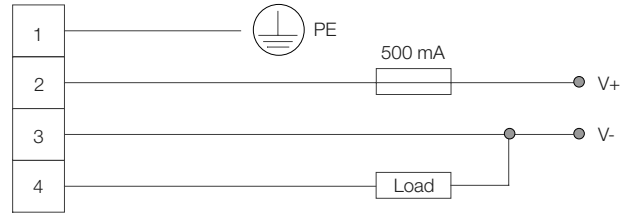
Weight: 0.5 kg (for R 3/4 and 3/4 NPT)

**Electrical connection**

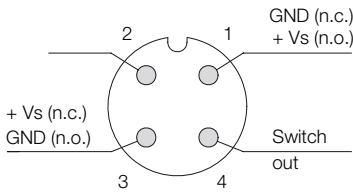
**NWS-...200...**  
 2-wire 24-240 V<sub>AC/DC</sub>,  
 serial Load,  
 I<sub>max</sub> ≤ 500 mA



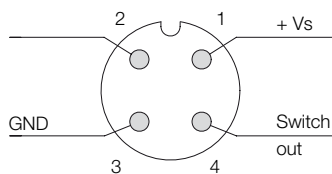
**NWS-...200...**  
 3-wire, V<sub>S</sub> = 24 V<sub>DC</sub>  
 Output PNP: U<sub>HIGH</sub> ~16.5 V;  
 U<sub>LOW</sub> ~2.5 V; I<sub>max</sub> ≤ 500 mA



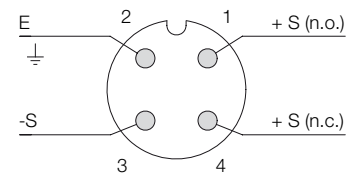
**NWS-...23/24 (24 V<sub>DC</sub>)**



**NWS-...2W/2H (WHG in preparation)**



**NWS-...2E... (ATEX)**

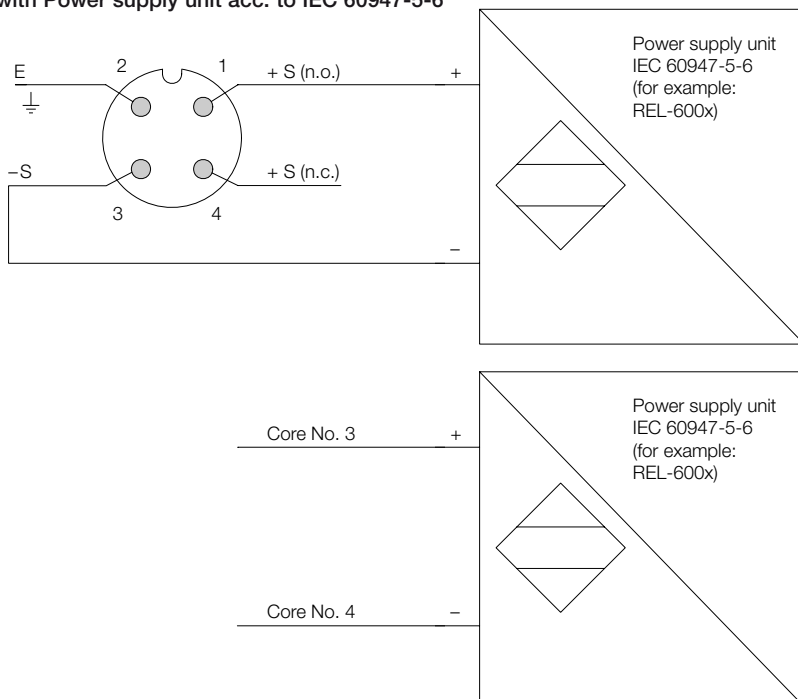


**Wiring diagram**

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

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

**Wiring examples NWS-...2E...**  
 with Power supply unit acc. to IEC 60947-5-6





**Order Details** (Example: NWS-R20 200 0070)

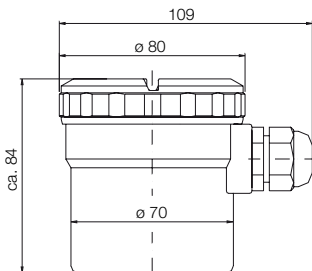
Connection	Model	Electrical connection	Sensor version
R 3/4 male thread	NWS-R20...	<b>Plastic housing</b> 200 = 24...240 V <sub>AC/DC</sub> Cable connection/terminal connection  <b>St. steel housing/plug connection</b> 23S = 24 V <sub>DC</sub> , PNP, plug M12x1 24S = 24 V <sub>DC</sub> , NPN, plug M12x1 2WS***= 24 V <sub>DC</sub> , WHG, PNP, plug M12x1 2HS***= 24 V <sub>DC</sub> , WHG, NPN, plug M12x1 2ES = ATEX approval, plug M12x1  <b>St. steel housing/cable connection</b> 23F = 24 V <sub>DC</sub> , PNP, 1.5 m Cable 24F = 24 V <sub>DC</sub> , NPN, 1.5 m Cable 2WF***= 24 V <sub>DC</sub> , WHG, PNP, 1.5 m Cable 2HF***= 24 V <sub>DC</sub> , WHG, NPN, 1.5 m Cable 2EF = ATEX approval, 1.5 m Cable	0070 = 70 mm standard 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 conn. DN 40 (DIN 11851)	NWS-L40...		
Sanitary conn. DN 50 (DIN 11851)	NWS-L50...		
Aseptic conn. DN 50 (DIN 11864)	NWS-H50...		
DRD Ø 125 mm flange	NWS-D1Z...		
Special connection	NWS-YYY...		

\*\*only models marked with \*are available with sensors in extended version.

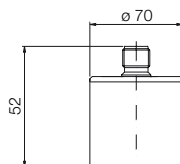
\*\*\*WHG-approval in preparation.

**Dimensions**

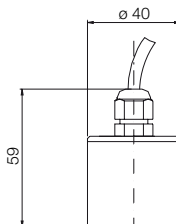
**NWS-...200**  
 24...V<sub>AC/DC</sub>  
 Plastic housing



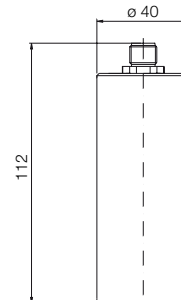
**NWS-...23S/24S**  
**NWS-...2WS/2HS**  
 24 V<sub>DC</sub>  
 Plug connection



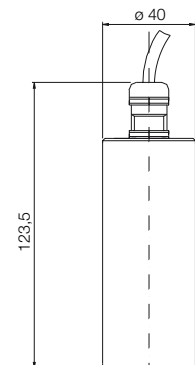
**NWS-...23F/24F**  
**NWS-...2WF/2HF**  
 24 V<sub>DC</sub>  
 Cable connection



**NWS-...2ES**  
 ATEX  
 Plug connection

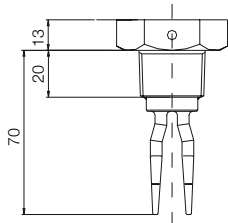


**NWS-...2EF**  
 ATEX,  
 Cable connection

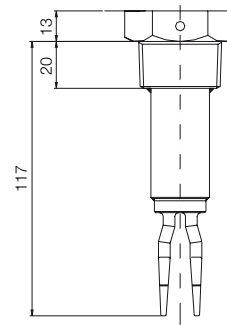


**Dimensions** (continued)

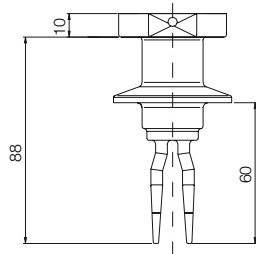
**NWS-...0070**  
(Standard, short)



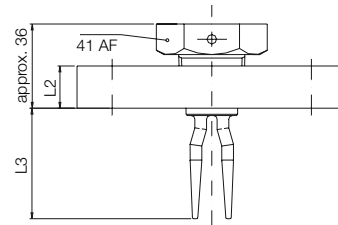
**NWS-R25...0117**  
**NWS-N25...0117**  
(Standard, long)



**NWS-T...**  
Tri-Clamp

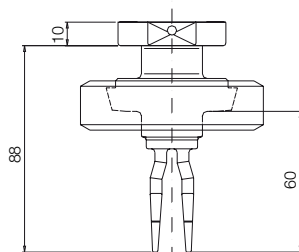


**NWS-F... / NWS-A...**  
Flange version

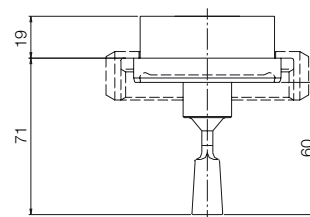


	<b>L 2</b>	<b>L 3</b>
DN 25 / PN 40	18	approx. 47
DN 50 / PN 40	20	approx. 95
ANSI 1" 300 lbs	17.5	approx. 41
ANSI 2" 300 lbs	22.4	approx. 92

**NWS-L...**  
Sanitary  
connection  
(DIN 11851)



**NWS-H...**  
Aseptic  
connection  
(DIN 11864)



# KOBOLD-System Construction

Planing, mounting and commissioning  
with cooperation partners



## Food and Beverage Industry



- Plants for the separation of yeast and salt suspensions as well as for grease and baking accessories
- Dosing plants for charging of continuous or discontinuous working paste kneading plants with meal flour, yeast and salt suspensions, sour knead, water, grease and other ingredients.
- Dosing systems to supplement milk and fruit juice during the manufacturing of children nutriments.
- Dosing systems for proportional blast of flavour in mixing drums dependant of the flow rate of cut tobacco.
- Plants for storage, load-carrying and for batch wise metering of food oil for the manufacturing of mayonnaise.

