

Thank you for choosing a NIVELCO instrument.
We are sure that you will be satisfied throughout its use!

1. APPLICATION

The conductive measuring principle can be applied to liquids with specific conductivity over 10 $\mu\text{S}/\text{cm}$. The switching unit can sense the resistance between probes. Conductivity measurement is suitable only for detecting the presence of liquid at a given level of the tank. This level is represented by the length of the probe.

The level switch consists of a NIVOCONT KRK-512-5 type switching unit and the KLN-2□□ type probes selected according to the task. Probes are to be connected to the NIVOCONT KS□-□□□ type probe socket head that can be screwed into the tank. If the material of the tank or its internal insulation is not conductive then a reference probe should be used in addition to the one, two, three or four probe(s), if the material of the tank is conductive, the tank can be used as a reference probe.

The conductive switch is suitable for filling / emptying control or level limit.

2. TECHNICAL DATA

2.1 GENERAL DATA

2.1.1 TECHNICAL DATA OF THE SWITCHING UNIT

Type	KRK-512-5
Probe voltage	3.5 V AC
Probe current	< 0.2 mA AC
Sensitivity	Adjustable: 5 k Ω ... 100 k Ω
Max. cable capacity	800 nF
Response	max. 400 ms
Setting accuracy (mech.)	$\pm 5\%$
Delay	Adjustable: 0.5 ... 10 s
t _r delay	1.5 s
Relay output	1x SPDT
Switching voltage	250 V AC1, 24 V DC
Switching current	8 A AC1
Switching power	2500 VA AC1, 240 W DC
Electrical strength	3.75 kV
Mechanical life-span	3 x 10 ⁷ switches
Electrical life-span	0.7x10 ⁶ switches
Power supply U _n	24V...240V AC / DC
Voltage range allowed	nominal voltage - 15% ... +10%
Power consumption	max 2.5 VA / W
Ambient temperature	-20 °C ... +55 °C
Electrical connection	max. 2.5 mm ² / with insulation 1.5 mm ²
Electrical protection	Class II.
Ingress protection	IP 20
Mechanical connection	DIN EN 60715 rail
Mass	72 g

2.1.2 TECHNICAL DATA OF PROBE SOCKETS

Type	KSK-201	KSP-201	KSS-201	KSN-201	KSH-202	KSH-203	KSH-204	KSH-301	KSH-302	KSH-303	KSH-304	KLN-2□□	KLP-201	KLP-204	
Nr. of probes	1				2+r	3+r	4+r	1+r	2+r	3+r	4+r	1	—	—	
Insulation of socket	ABS	PP	PFA				—				—	—	—		
Cable gland	Pg 9	M4 nut, rubber cap protected			M20x1.5 cable diameter 6 ... 12 mm										
Process connection	—	3/8" BSP				1 1/2" BSP				M6	—	—			
Socket material	—	PP	A44 c. steel	KO35 stainless steel (1.4571)			PP				KO35 1.4571	—	—		
Housing material	—				Paint coated aluminium cast				PBT				—	PP	PVDF
Medium temperature	max 80°C				max 200 °C				max 80°C				—	max 80°C	max 130°C
Max. pressure	—	0.3MPa			1.6 MPa				0.3 MPa				—	—	—
Ingress protection	—	IP 20				IP 65				—				—	—
Mass	0.05 kg	0.1 kg				0.4 kg				0.22 kg/m				—	—

r = reference probe

2.2 ORDER CODES

NIVOCONT KRK-512-□

Power supply	CODE
24-240 V AC/DC	5

NIVOCONT KLN-2 □□

Probe length*	CODE
0.5 m ... 3 m	05... 30

* to be ordered in 0.5 m units

NIVOCONT KS□-□□□

TYPE	CODE
Cable probe	K
SINGLE PROBE	
PP socket	P
Carbon steel socket	S
St. steel socket	N
MULTIPLE PROBES	
St. steel socket	H

HOUSING MAT.	CODE
Aluminium	2
Plastic	3

PROBE NUMBER	CODE
1 + ref. probe*	1
2 + ref. probe	2
3 + ref. probe	3
4 + ref. probe	4

* only plastic version

Separator:

NIVOCONT KLP-201 for plastic version
NIVOCONT KLP-204 for aluminium version

2.4 DIMENSIONS

SWITCHING UNIT KRK-512-5	CABLE PROBE KSK-201	PROBE SOCKET KSH-20□	PROBE SOCKET KSP-201 / KSS-201 / KSN-201	PROBE KLN-2□□
PROBE SOCKET KSH-202 KSH-203 KSH-204	SEPARATOR KLP-204	PROBE SOCKET KSH-30□	SEPARATOR KLP-201	

2.3 ACCESSORIES

- User's manual
- Certificate of Warranty
- Declaration of Conformity
- Sealing (2 mm thick) (KLINGER OILIT)
 - 1 pc. 3/8" (for KSP-201, KSS-201, KSN-201)
 - 1 pc. 1 1/2" for a KSH-20_
- M6 nut (standard SW):
 - 3 pcs. for KSH-202
 - 4 pcs. for KSH-203, KSH-204
- M6 nut (non-st. SW):
 - 1pc. for KSH-204

NIVOCONT
KRK - 512 CONDUCTIVE
LEVEL SWITCH

USERS MANUAL



NIVELCO

3. INSTALLATION

KRK-512-5 switching unit can be mounted on DIN EN 60715 rail.

It is recommended that the KLN-2□□ type probes are cut to the length required for level detection on site. The probes should be screwed into the KS□-20□ type sockets.

ALWAYS REMEMBER TO TIGHTEN THE PROBE WITH AN M6 NUT!

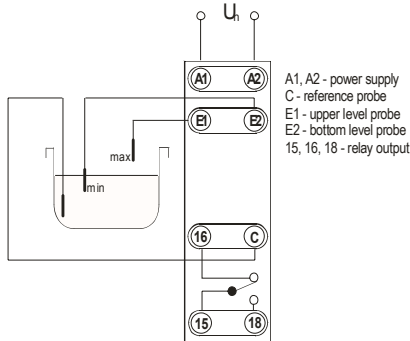
When using KSH-204 type probe sockets the reference probes should be tightened with special SW hexagonal M6 nuts!

It is suggested that KLP-□□□ type separators be used at every 0.5m for multiple probe devices to keep the probes apart.

A KSK-201 single probe, attached to an insulated cable, can be lowered into pits and wells without running the risk of a short circuit. When a measurement is needed in a well or in a plastic pipe 2 of them have to be used.

4. ELECTRICAL CONNECTION

If the wall of the tank is conductive no reference probe is needed. In this case terminal C is to be connected to the tank. On multiple probe units E1 and E2 are marked with 1...4, the reference probe is marked with C. Admissible length of cable between signal processor and probes depends on cable capacity and conductivity.



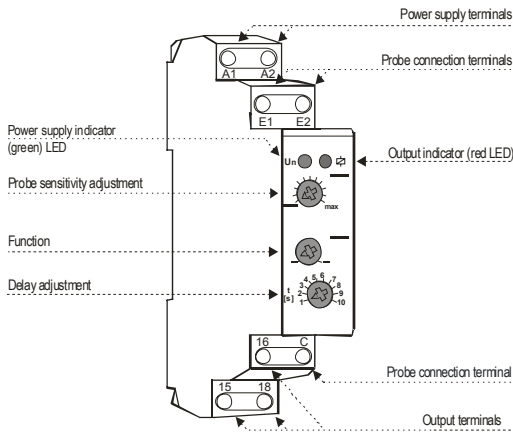
Connections for NIVOCONT KRK-512-5

5. PUTTING INTO OPERATION

5.1. ADJUSTMENT

The green LED (U_n) shows that the unit is on, and the energised state of the relay is indicated by the red LED. Operating mode and delay time (ON and OFF) can be set with the rotary selector switch and potentiometer on the front panel.

To set the sensitivity using SENS potentiometer do the following: submerge all probes into the fluid. Set a minimal delay time (t). Adjust the sensitivity from min. to max. value until the relay becomes energised. Now set the sensitivity a little higher, but don't set a higher sensitivity than needed.



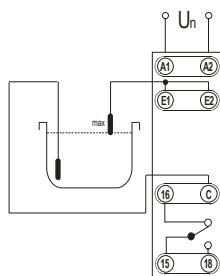
Front panel of NIVOCONT KRK-512-5

5.2. LED INDICATION

- Green LED is on – power supply is on
- Red LED is on – relay is switched on (contacts 15 and 18 are closed)
- Red LED is off – relay is disconnected (contacts 15 and 16 are closed)
- Red LED blinking – output delay indication

5.3. SINGLE-LEVEL MONITORING LIMIT SWITCHING

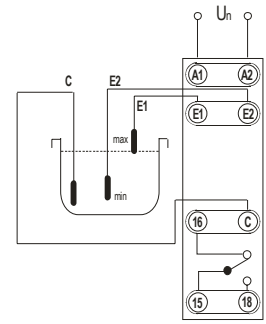
If KRK-512-5 is monitoring only one level, the sensor probe should be connected to both E1 and E2 terminals. For High Fail-safe mode indication the 'PUMP' switch should be in 'UP' position and for Low level alarm indication in 'DOWN' position. Level alarm conditions are indicated in the same way (by de-energised relay state) as when a power cut-off occurs.



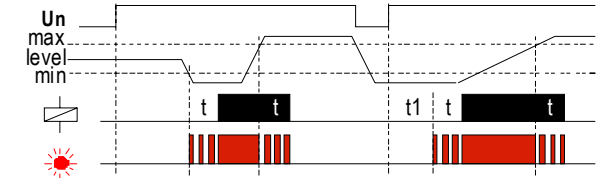
5.4. LEVEL CONTROL

NIVOCONT KRK-512-5 can be used for control of filling or emptying.

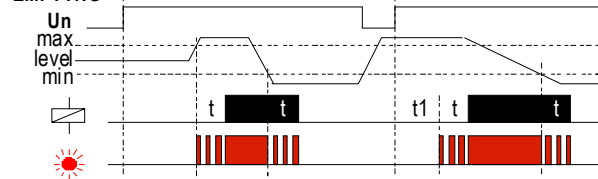
During filling control the 'PUMP' switch should be in position 'UP' and during emptying control in position 'DOWN'. That way in case a power supply outage occurs (energised relay) overfilling or unwanted emptying is prevented.



FILLING



EMPTYING



6. MAINTENANCE, REPAIR

The device does not require regular maintenance.

Repair within and beyond the warranty period is carried out at the Manufacturer's location.

7. STORAGE

Ambient temperature: -30 ... 70 °C

Relative humidity: max. 85%

8. WARRANTY

All Nivelco products are warranted free of defects in materials or workmanship for a period of two years from the date of purchase, as indicated in the Certificate of Warranty.

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Nivelco reserves the right to change technical data without notice!