

Thank you for choosing a HiTECH/NIVELCO instrument.  
We guarantee that you will be happy with this instrument.

## 1. APPLICATION

Conductive measuring principle can be applied for liquids with specific conductivity over  $2 \times 10^{-5}$  s/cm. The signal processor can sense the resistance between probes. Conductive measurement is only suitable to detect the presence of liquid at a given level of the tank. This level will be represented by the length of the probe.

The level switch consists of NIVOCONT KRK-402-□ type signal processor and KLN-2□□ type probes selected according to the application. Probes should be connected to the NIVOCONT KSK-20 type probe socket head that can be screwed in the tank. The length of the probe, penetrating into the tank, is to be cut according to the level To be detected.

If the tank or its inside wall insulation is not conductive, in addition to the one, two, three or four probe(s) reference probe should be used. Level control will be performed by the DPDT output relay. Conductive switch is suitable for control of filling / emptying or limit value indication.

## 2. TECHNICAL DATA

### 2.1 GENERAL DATA

#### 2.1.1 TECHNICAL DATA OF THE RELAY UNIT

Type	KRK-402-□
Function / input	Limit switching / 1 probe + 1 reference probe Control / 2 probe + 1 reference probe
Probe voltage	max 16 VAC
Probe current	max. 7 mA
Sensitivity	Adjustable: 0,25 kΩ ... 100 kΩ (4 mS ... 10 μS)
Switch on delay	Adjustable: 0,5 ... 10 s
Switch off delay	Adjustable: 0,5 ... 10 s
Output	2 nos DPDT
Load	250V AC 5A, 1250 W units mounted with space more than 5 mm
Insulation voltage	4000 V 50 Hz
Mechanical life cycle	20 x 10 <sup>6</sup> switch
Electrical life cycle	2 x 10 <sup>5</sup> switch
Power supply (nominal)	24, 110, 230 V AC, 50 ... 60 Hz
Power supply range	- 15% ... +10% of the nominal value
Consumption	< 2 VA
Ambient temperature	-13°F - 135°C (-25°C ... + 55 °C)
Electric connection	0,5 ... 2,5 mm <sup>2</sup> twisted wires or 2 x 0,5 ... 1,5 mm <sup>2</sup> twisted wires
Electric protection	Class II ; reinforced insulation
Ingress protection	IP 40
Mounting	DIN EN 50022-35 rail mounted
Mass	≈ 0,2 kg

#### 2.1.2 TECHNICAL DATA OF THE PROBE

Type	KSK-201	KSP-201	KSS-201	KSN-201	KSH-202	KSH-203	KSH-204	KLN-2□□
Number of probes	1			2 probe + 1 ref	3 probe + 1 ref	4 probe + 1 ref	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"NPT/ BSP			1 1/2" NPT		M6		
Socket material	— PP A44 steel		KO35 stainless steel (1.4571)					
Housing	—			Paint coated aluminium cast		—		
Medium temperature	— max 80°C		max 394°F (200°C)					
Max. pressure	— 0,3 MPa		1,6 MPa					
I Protection	— IP 20			IP 65		—		
Mass	0,05 kg	0,1 kg		0,4 kg		0,22 kg/m		

## 2.3 ORDER CODES

NIVOCONT KRK-402-□

Power supply	Code
230V AC	1
110V AC	2
24V AC	3

NIVOCONT KLN-2□□

Probe length*	Code
0,5m ... 3m	05...30

\* to order with spaces of 0,5 m

NIVOCONT KSK-20□

Version	Code	Probe number	Code
Cable probe	K	1 no	1
1 probe PP socket	P	2 nos + reference probe	2
1 probe Steel socket	S	3 nos + reference probe	3
1 probe, stainless-steel socket	N	4 nos + reference probe	4
Multiple probe St. st. socket	H		

NIVOCONT KLP-204 Probe spacer

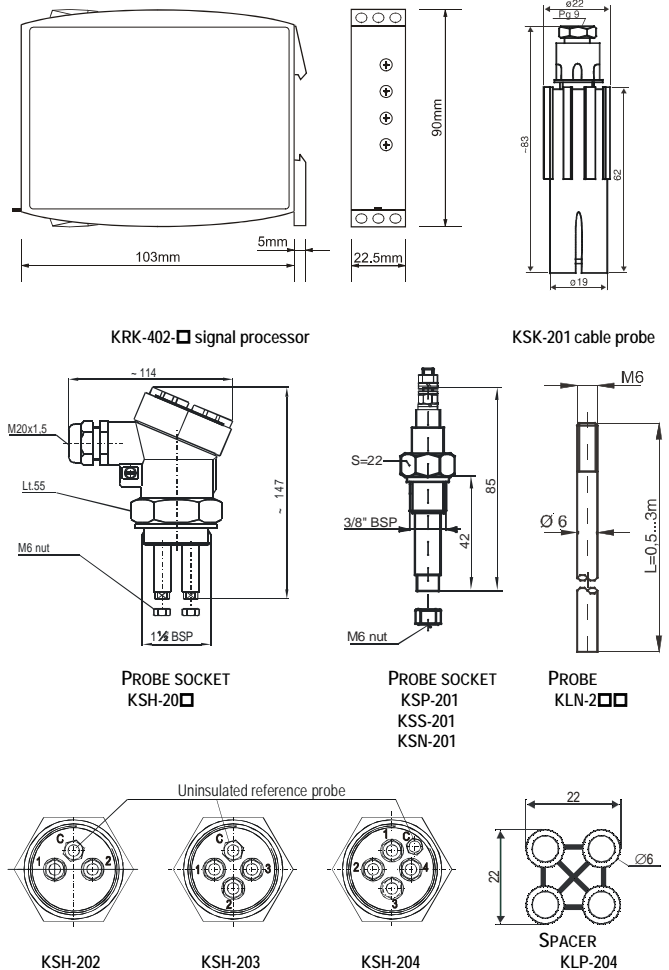
## 2.2 ACCESSORIES

- User's Manual
- Guaranty certificate
- Washer 2 mm strong (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



Manufacturer  
HITECH/NIVELCO Control Co.  
301 Oxford Valley Road, Yardley, PA 19067.  
Tel: 215.321.6012 Fax: 215. 321. 6067  
e-mail: info@hitechtech.com  
http://www.hitechtech.com

## 2.4 DIMENSIONS



## 3. INSTALLATION

KRK-402-□ signal processor is to mount on DIN EN 50022-35 rail. It is recommended to cut the probes type KLN-2□□ to the length required for detection of the level on the site. The probe is to be screwed into the socket type KSK-20□□.

### THE PROBES ARE TO JAM WITH A M6 NUT!

With the probe socket of type KSH-204 the jamming of the reference probe require M6 nut with special SW hexagonal!

For multiple probe devices the use of KLP-204 type, PVDF spacer, suitable up to 130°C is suggested in every 0,5-meter keeping probes apart.

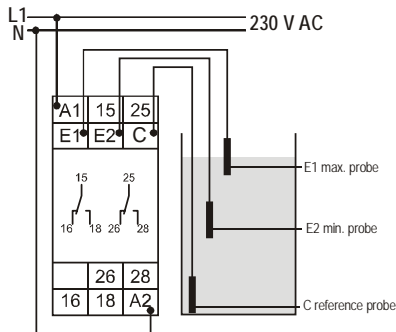
KSK-201 single probe can, at the end of an insulated cable be lowered into pits and wells without the risk of short circuit. For the use in plastic pipes 2 nos are to apply.

#### 4. WIRING

If the wall of the tank is conductive no reference probe is needed. In this case pot C is to be connected to the tank. E1 and E2 in multiple probe units are marked with 1 and 2

Maximum length of the cable depends on the resistance of the liquid and capacitance of the cable.

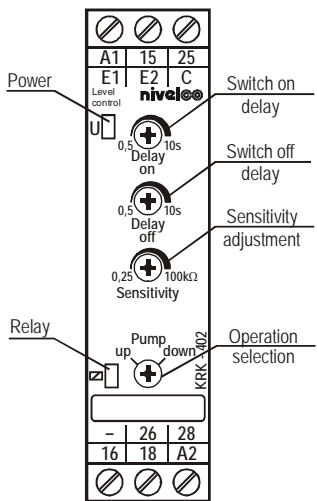
M4 nuts in the probe socket must not be screwed harder than 6 Nm



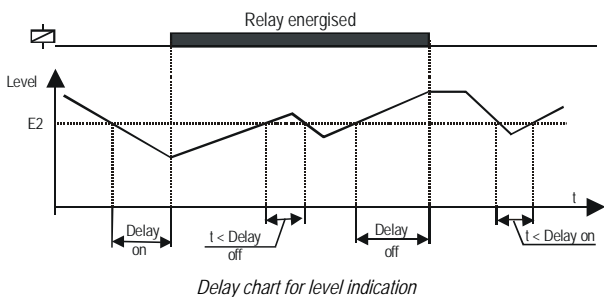
Level control wiring of NIVOCONT KRK-402-1

#### 5. COMMISSIONING, ADJUSTMENT

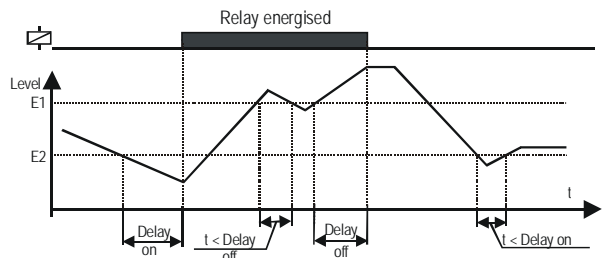
If the unit is on the green LED (U) is lit and the energised state of the relay is indicated by the lighting of the yellow LED (Z). Operation can be selected by the switch PUMP UP/DOWN. Delay for energising and de-energising of the relay can be set with the potentiometer DELAY ON and DELAY OFF respectively. Level changes lasting shorter than the delay set (undulation) would not be considered. Sensitivity can be adjusted depending on the resistance of the liquid. Excessive sensitivity can cause unwanted switching even as a consequence of condensation.



Front panel of the NIVOCONT KRK-402



Delay chart for level indication



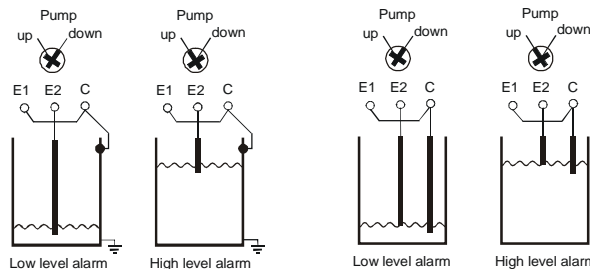
Delay chart for filling control

#### 5.1. LEVEL DETECTION

The level at which switching occurs will be defined by the length of the probe connected to the input E2.

FOR THIS APPLICATION THE POINTS E1 AND C HAVE TO BE INTERCONNECTED.

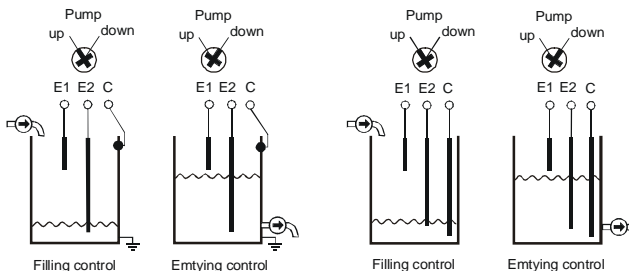
For High level alarm indication the PUMP switch should be in position UP for Low level alarm indication in position DOWN. Level alarm conditions are indicated the same way by de-energised relay state as the cut off of power.



Level detection with conductive tank wall    Level detection with not-conductive tank wall

#### 5.2. LEVEL CONTROL

NIVOCONT KRK-402-Z can be used either for control of filling or for emptying. For filling the PUMP switch should be in position UP for emptying in position DOWN. Filling pump or emptying solenoid valve powered over the energised relay prevents overflowing or unwanted emptying during power off.



Level control with conductive tank wall    Level control with non-conductive tank wall

#### 6. MAINTENANCE, REPAIR

Device does not require regular maintenance

Repair with and beyond the warranty period will be carried out at the Manufacturer.

#### 7. STORAGE

Ambient temperature: -25 ... 70 °C

Air humidity: max. 85%

#### 8. GUARANTY

All HITECH/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.