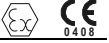


Thank you for choosing NIVELCO product.
We are sure that you will be satisfied throughout its use.

USER'S MANUAL



1. APPLICATION

UNICONT PKK-312- series is a 4-20 mA, current controlled switch the relay of which would switch over at currents (taught to the unit), depending on the limit, switching difference or window comparator modes selected by programming. Fault condition monitoring can be switched on or off and it can be selected that the relay should be energised or de-energised when detecting failure. Failure may be represented by discontinuity of cable/lower value fault current or short circuit/upper value fault current.

The unit is suitable for powering all NIVELCO made 2-wire (4-20 mA) transducers.

Some models of this series meet requirements for intrinsically safe output.

UNICONT PKK-312-8 Ex unit is able without any further programming to monitor current levels of the DC powered, 2-wire NIVOSWITCH Ex vibration fork both in damped and in vibrating modes as well as to control relay output.

2. TECHNICAL DATA

2.1 GENERAL DATA

TYPE	PKK-312-□	
Nominal input current range	1 ... 22 mA	
Accuracy of switching level/threshold level	± 0.1 mA	
Discontinuity threshold/Lower value fault current	3.7 mA	
Short circuit threshold/Upper value fault current	22 mA	
Input impedance	10 Ω	
Input overload capability	maximum 100 mA (permanent)	
Damping	0,1 s; 1 s; 2 s; 5 s selectable	
Relay	- Output	1 piece SPDT
	- Rating	250 V AC, 8 A, AC1
	- Insulation strength	4000 V 50 Hz
	- Electrical / Mechanical life time	10 ⁵ / 2 x 10 ⁶ switching
Electrical connection	max. 2,5 mm ² twisted or maximum 4 mm ² single cable	
Mechanical connection	DIN EN 50022-35 rail mounted	
Ingress protection	IP 20	
Mass	≈ 0.21 kg	

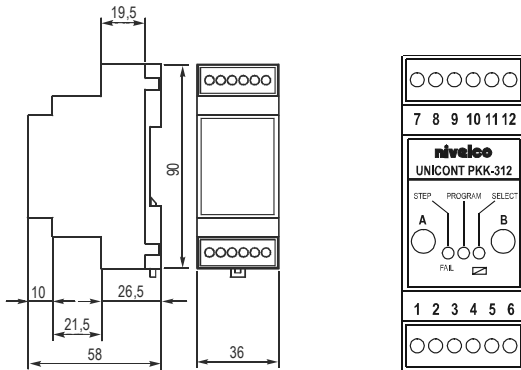
2.2 SPECIAL DATA

TÍPUS	EX APPROVED MODELS					ORDINARY MODELS				
	PKK-312-5 Ex	PKK-312-6 Ex	PKK-312-9 Ex	PKK-312-7 Ex	PKK-312-8 Ex	PKK-312-1	PKK-312-2	PKK-312-3	PKK-312-4	
Power supply range	230 V AC ± 10% 50...60 Hz	110 V AC ± 10% 50...60 Hz	24 V AC ± 10% 50...60 Hz	24 V AC ± 10%, 50...60 Hz, 24 V DC ± 15%		230 V AC ± 10% 50...60 Hz	110 V AC ± 10% 50...60 Hz	24 V AC ± 10% 50...60 Hz	24 V AC ± 10%, 50...60 Hz, 24 V DC ± 15%	
Power consumption	< 2.5 VA			< 2.5 VA	< 2.5 W	< 2.7 VA			< 2.5 W	
Switching levels	2 values in the range of 1 ... 22 mA				10.5 mA; 12.5 mA		2 values in the range of 1 ... 22 mA			
Ex protection mark	II (1) G [EEx ia] IIB			II (1) G [EEx ia] IIC		-				
Intrinsically safe maximum values	U ₀ < 28.4 V; I ₀ < 140 mA; P ₀ < 1.1 W; L ₀ < 6 mH; C ₀ < 50 nF			U ₀ < 28.4 V; I ₀ < 80 mA; P ₀ < 0.6 W L ₀ < 4 mH; C ₀ < 50 nF		-				
Output load capability	I _T = 22 mA when U _{OUT} ≈ 12 V			I _T = 22 mA when U _{OUT} ≈ 15 V		U ₀ = 30 V I _{MAX} = 70 mA U _{OUT min} = 16 V			U ₀ = 24 V I _{MAX} = 80 mA U _{OUT min} = 23 V	
Protection class	Class II			Class III		Class II			Class III	
Ambient temp.	-10 °C ... +55 °C					-10 °C ... +55 °C				

2.3 ACCESSORIES

- User's Manual
- Certificate of Warranty
- Declaration of Conformity

2.4 DIMENSIONS



2.5 ORDER CODE

P K K - 3 1 2 - □ Ex*

POWERING / Ex	CODE
230 V AC	1
110 V AC	2
24 V AC	3
24 V AC / DC	4
230 V AC Ex	5
110 V AC Ex	6
24 V AC / DC Ex	7
24 V AC / DC Ex	8**
24 V AC Ex	9***

- * Ex models should be marked with Ex
- ** For DC powered, 2-wire NIVOSWITCH Ex vibrating fork of NIVELCO
- *** Approval pending

3. INSTALLATION

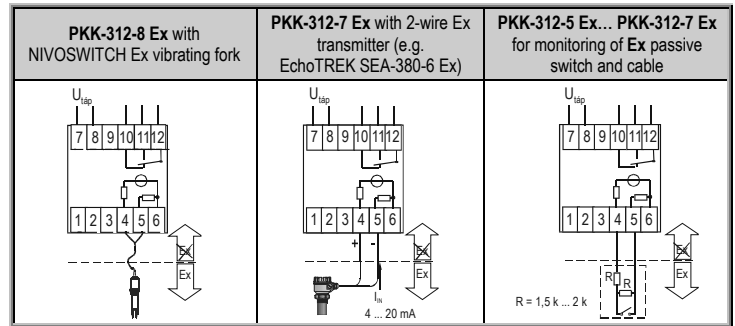
UNICONT PKK-312-□ should be mounted on DIN EN 50022-35 rail.

NOTE!

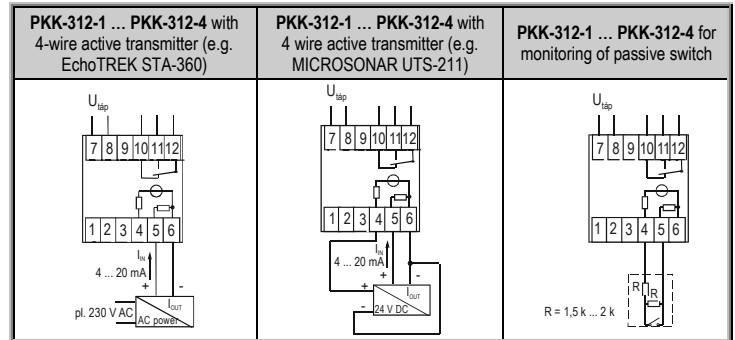
Prior to the installation make sure that the input current values can be provided by the loop of the application. If not, teaching of the current values has to be carried out before installation and wiring. (See Point 5 "Teaching current value of tripping point")

4. WIRING

4.1 EX MODELS



4.2 ORDINARY MODELS

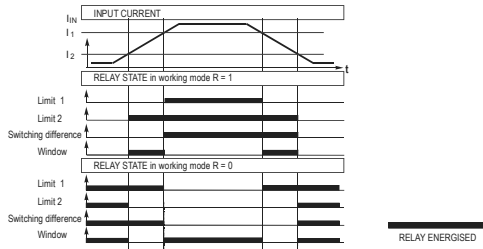


5. INSTALLATION AND SETTING UP

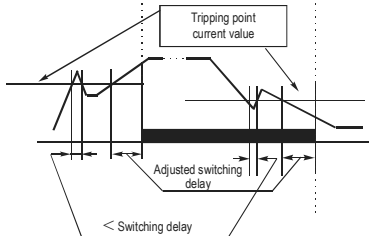
After 3 s from power up the unit begins to work with the signals as per table of WORKING STATUS.

WORKING STATUS		
LED	Indication	Interpretation
SELECT	GREEN	Relay energised R=1
	RED	Relay de-energised R=0
	SIMULTANOUS RED BLINKING OF BOTH LED	Memory failure, Relay state sustained
FAIL (STEP)	GREEN	No cable fault/No fault current. No cable monitoring
	RED	Cable fault, or, fault current

The state of the relay in accordance with the operation mode and depending on the input current will be as shown on the left hand diagram. Operation with delayed switching is demonstrated on the right hand diagram.



State of the relay depending on the input current



Relay operation with delayed switching

CAUTION!

If on power up of a unit, set for switching differential, the value of the current will be between the two tripping points, the relay would always remain de-energised irrespectively of the relay operation mode (R = 1 or R = 0) programmed before.

Depending on the actual task, programming of the unit may be needed which involves setting of the Operating Mode with the possibilities as below
PKK-312-8 Ex unit can be used without any programming for the powering and remote switching function of the Nivelco made DC powered, 2-wire NIVOSWITCH Ex vibrating fork. **Tripping point current values of 10,5 and 12,5 mA and switching differential operating mode can not be changed!**

Setting possibilities:

- Relay operating mode (Default: R = 1)
- Monitoring of cable discontinuity (Default: NONE)
- Monitoring of cable short circuit (Default: NONE)
- Damping (Default: 0.1 s)
- Return to default

A PKK-312-1...PKK-312-7 Ex

Setting possibilities:

- Selection of comparison type (Default: Switching difference)
- Teaching current value (Default: 10,5 mA and 12,5 mA)
- Relay operating mode (Default: R=1)
- Monitoring of cable discontinuity (Default: NONE)
- Monitoring of cable short circuit (Default: NONE)
- Damping (Default: 0,1 s)
- Return to default

PROGRAMMING

Programming involves setting of operating mode and teaching of the input current.

Programming / viewing operating mode

Programming can be entered by pressing key A (for about 5s) till the LED PROGRAM lights up. While in programming mode by short pressing of key A the adjustment columns as per the table below can be accessed step by step, indicated by the relevant LED STEP. Being in the desired column the required raw can be selected by short pressing of key B indicated by the relevant LED SELECT. After performing adjustment needed, programming mode can be quit by pressing key A (for about 5 s) till the LED PROGRAM goes off.

PROGRAMMING / VIEWING OPERATING MODE					
Enter programming mode: press key A (for about 5 s) till the LED PROGRAM lights up					
Adjustment columns with corresponding LED STEP states, accessed by short pressing of key A					Adjustment raw with relevant state of the LED SELECT, selected by short pressing of key B
GREEN	GREEN BLINKING	RED	RED BLINKING	OFF	
Relay operation mode	Comparat or operation mode	Cable short circuit */ monitoring lower current	Cable discontinuity */ monitoring upper current	Switching delay	
R = 1	Limit value 1.	ON, relay should be activated	ON, relay should be activated	0,1 s	GREEN
R = 0	Limit value 2.	ON, relay should be released	ON, relay should be released	1 s	GREEN BLINKING
--	Switch. diff	NO	NO	2 s	RED
--	Window	--	--	5 s	RED BLINKING
Quit programming mode: press key A (for about 5 s) till the LED PROGRAM goes off.					

Cable monitoring can only be applied with Ex certified 2-wire units.

AUTOMATIC QUITTING PROGRAMMING MODE

The unit will operate during programming in accordance with the previous parameters entered in the last completed programming. The new modified parameters will only be effective after quitting programming mode.

Having left the transmitter in programming mode, it would after 30 s automatically quit programming mode. Since this represents uncompleted programming, the performed modification would not be effective.

RELAY TEST

Proper operation of the relay can be tested by pressing key B for about 5 s as a consequence of which the state of the relay and colour of the LED (e.g. from green to red) would be changed. Releasing the key the relay and LED would return to the previous position.

RETURN TO DEFAULT

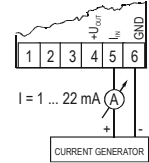
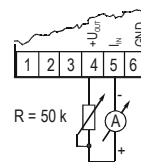
Programming would be returned to default if keys A and B are pressed before/during power up.

TEACHING CURRENT VALUE OF TRIPPING POINT

Teaching input currents represents saving of I_{IN} current values for switching point 1 and switching point 2 prevailing between terminals (as per right hand drawing) at the moment of the teaching.

Necessary current values can be provided by one of the arrangements or by the circuit of the actual application on site.

If the input current will be provided by the circuit of the actual application its value have not to be known.



Arrangements for teaching input currents

To perform teaching, keys A and B should be pressed simultaneously for about 5 s until teaching mode has been entered, indicated by the blinking of LED PROGRAM. Releasing key B, or A (only one of them) the momentary current value will be assigned to switching point 1 or 2. Also releasing the other key, teaching will be completed, indicated by the going off of LED PROGRAM. Having taught the first current value, the other one can also be taught without quitting teaching mode, whereas the key already released should be pressed again (for about 5 s) and the other key released.

TEACHING					
	Position of key A	Position of key B	STEP LED	PROGR. LED	SELECT LED
Entering teaching mode	KEEP PRESSED > 5 s		OFF	blinking	OFF
Teaching current value for point 1	KEEP PRESSED	RELEASE	OFF		GREEN if SUCCESSFUL RED blinking if FAILED
Quitting teaching mode	RELEASE	-	According to WORKING STATUS	OFF	According to WORKING STATUS
Entering teaching mode	KEEP PRESSED > 5 s		OFF	blinking	OFF
Teaching current value for point 2	RELEASE	KEEP PRESSED	GREEN if SUCCESSFUL RED blinking if FAILED		OFF
Quitting teaching mode	-	RELEASE	According to WORKING STATUS	OFF	According to WORKING STATUS

6. MAINTENANCE AND REPAIR

The unit does not require regular maintenance. All repairs will be carried out at the manufacturer's premises.

7. STORAGE

Temperature: -30 °C ... +60 °C

Humidity: maximum 98%

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.

October 2003

Nivelco reserves the right to change technical data without notice!