

Unicont™ **PKK-312** **Current Controlled Switch**



Model PKK-312

HiTECH Technologies, Inc.

301 Oxford Valley Road - Building 505A - Yardley, PA 19067-7706

Tel: 215. 321. 6012; Fax: 215. 321. 6067

Tech Support (Toll Free) 866-DrLevel or 888-NIVELCO

Email: info@DrLevel.com or info@hitechtech.com

Web Site: www.DrLevel.com or www.hitechtech.com

1. APPLICATION

UNICONT PKK-312- series is a 4-20 mA, current controlled switch, the relay of which switches 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 such that the relay will be energized or de-energized 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 operation.



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

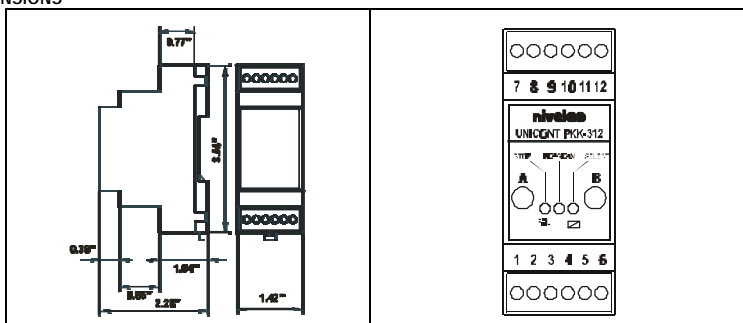
TYPE		PKK-312-□
Nominal input current range		1 ... 22 mA
Accuracy of switching level/threshold level		± 0,1 mA
Discontinuity threshold/Lower value fault current		3,7 mA
Short circuit threshold/Upper value fault current		22 mA
Input impedance		10 Ω
Input overload capability		maximum 100 mA (permanent)
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 ⁶ / 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

TYPE	EX APPROVED MODELS				
	PKK-312-5 Ex	PKK-312-6 Ex	PKK-312-9 Ex	PKK-312-7 Ex	PKK-312-8 Ex
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%	
Power consumption	< 2,5 VA			< 2,5 VA ; < 2,5 W	
Switching levels	2 values in the range of 1 ... 22 mA				10,5 mA 12,5 mA
Ex protection mark	 II (1) G [EEx ia] IIB			 II (1) G [EExia] 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 _r =22 mA when U _{OUT} 12 V			I _r =22 mA when U _{OUT} 15 V	-
Protection class	Class II			Class III	
Ambient temp	-10 °C ... +55 °C				

ORDINARY MODELS				
TYPE	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%
Power consumption	< 2,7 VA ; < 2,5 W			
Switching levels	2 values in the range of 1 ... 22 mA			
Ex protection mark	-			
Intrinsically safe maximum values	-			
Output load capability	$U_0 = 30\text{ V}$ $I_{MAX} = 70\text{ mA}$ $U_{OUT\ min} = 16\text{ V}$			$U_0 = 24\text{ V}$ $I_{MAX} = 80\text{ mA}$ $U_{OUT\ min} = 23\text{ V}$
Protection class	Class II			Class III
Ambient temp	-10 °C ... +55 °C			

2.3 DIMENSIONS



3. INSTALLATION

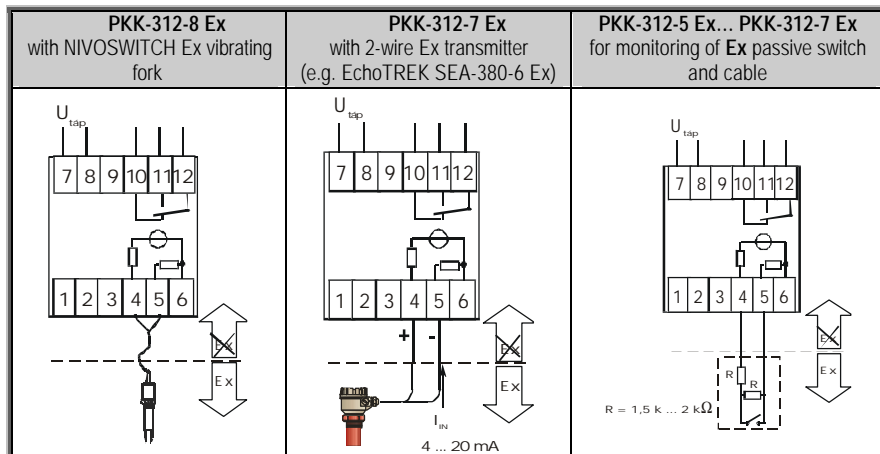
UNICONT PKK-312-□ should be mounted on DIN EN 50022-35 rail.

NOTE!

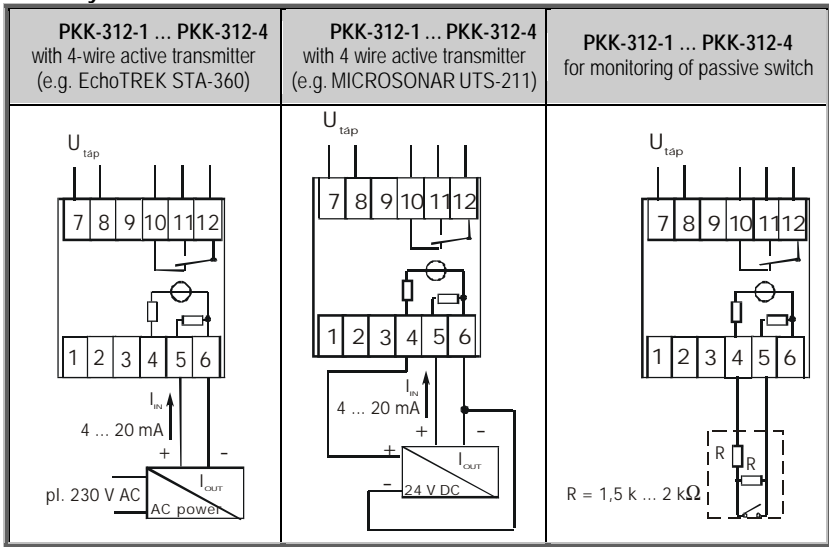
Prior to the installation make sure that the input current values can be provided by the loop of the application. If not, teaching of the current values has to be carried out before installation and wiring. (See Point 5 "Teaching current value of tripping point")

4. WIRING

4.1 EX MODELS



4.2 Ordinary models

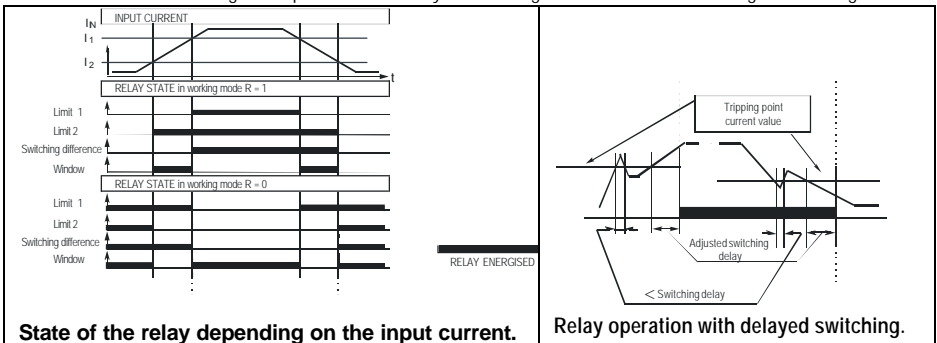


5. INSTALLATIONS AND SETTING UP

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.
	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.



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 cannot 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	

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

Setting possibilities:

Selection of comparison type	(Default: Switching difference)
Teaching current value (Default: 10,5 mA és 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 5s) till the LED **PROGRAM** goes off.*

PROGRAMMING / VIEWING OPERATING MODE					
Enter programming mode: press key A (for about 5s) 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	Comparator 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
--	Switching diff.	NO	NO	2 s	RED
--	Window	--	--	5 s	RED BLINKING
Quit programming mode: press key A (for about 5s) 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

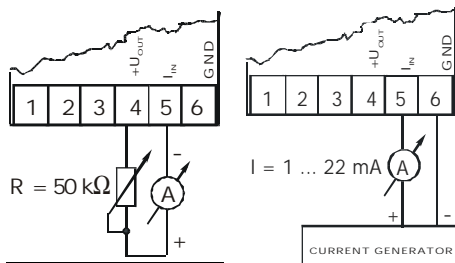
Programming would be returned to default if keys **A** and **B** are pressed before/during power up.

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 5s 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	PROGRAM 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

The device does not require maintenance on a regular basis. In some instances, however, the device may need a cleaning from deposited material.

7. STORAGE CONDITIONS

Environmental temperature range: -30°C to +60°C

Relative humidity: max. 98 %

8. PERFORMANCE GUARANTEE

Since 1986, every instrument sold by *HiTECH* has been guaranteed to perform in the application it originally was engineered and recommended for. Our company policy remains the same; every product sold comes with a written performance guarantee.

Should the equipment be unable to perform satisfactorily in your application and we are not able to correct the problem, we will accept the instrument in return and issue full credit. This performance guarantee is valid for 60 days. Thereafter, our standard limited two years factory warranty goes into effect.

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